ORGANIC GARDENING

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ORGANIC GARDENING — Emmaus, Pa.

The Forum

WORTH READING

Dear Mr. Rodale:

Quite by accident I subscribed to *Organic Gardening*. After reading the first two issues, it seemed logical to follow with *Pay Dirt, An Agricultural Testament* and *Earthworms*.

Your approach to the subject seems to me to be so in harmony and balance with the forces of Nature that I decided to read a chapter or two to my sons, age 14 and 16. At first they wiggled respectfully in their chairs, *completely bored*. It wasn't for long, tho, for these kids are quick to recognized "meat" in a coconut.

After I finished the eldest spoke up and said, "You know, Dad, that's the kind of 'stuff' I like." The youngster took the chapter on the Nile Valley in *Earthworms* to school to form the basis of a report.

It seems a pity to me that these three intriguing masterpieces are not read in school. I say that for the reason that when you and I were kids, a man was not considered normal if he could not sit in and discuss the subject of farming and husbandry—he was thought "peculiar" if he did not understand something, at least, about "the ground," horses or cattle.

Now, apparently, we feed our youngsters on sweet lavender and sissypants stuff in school, I'm judging from the comments I hear from the "gang". Yet I am confident they yearn for the rich blood of the original teachings which made this country great.

In harking back to the original teachings you have all made a great contribution toward a return toward harmony in thought and action. It seems to me I see a glimmer at least, of the light of fundamental thinking returning.

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—o—

A NORWEGIAN CORRESPONDENT

Kristiansand S.
Norway
April 22, 1946.

Gentlemen:

Recently, a friend of mine in New York City, sent me some seed catalogues and folders, all pertaining to gardening and agriculture. Among them was one advertising your magazine and a book: "Compost and How to Make It". I am very much interested in both.

I have been interested in gardening ever since I can remember, and as I am now close to fifty, so I am conceited enough to believe I have some experience. During the war chemical fertilizers became almost unobtainable for small gardeners who didn't produce for the market, and we had to make out, how best we could with compost and kitchen offal. The result on my half-acre was remarkable. My crops: fruits, berries, potatoes and all kinds of vegetables decreased from 5% to 20% in bulk, potatoes and vegetables most. We were alarmed at first, until both my wife and I found out, that the produce had increased surprisingly in quality. Everything from the garden tasted better than before, but best of all was the increased resistance against all kind of rot and mildew during winter storage, which is quite a problem here in Norway. The net result is, that *without* artificial fertilizers I carry slightly less into my cellar, but throw practically nothing out; *with* artificial fertilizers, I had to sort out

and throw away quite a lot, especially potatoes, cabbages and carrots, in late winter. My wife has also been very satisfied with her preserves lately.

Well, the war is over, and chemical fertilizers are in the market again; but I don't feel like buying. I am off that stuff forever. But I still have a lot to learn about composts and organic gardening, and I will be glad to hear from you.

Yours sincerely,
Arne Endresen

—o—

LETTER RECEIVED FROM FERTILIZER DEALER

I am in business handling groceries, feeds and fertilizers, and have just disposed of two cars of chemical fertilizers, but have not put a single pound on my own garden.

(Name withheld)

—o—

FOOD FOR THE PUBLIC

From the June, 1946 *Bulletin of the Health Education League of Portland, Oregon.*

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work of portage the Hunzas climb over the mountains like cats. The Hunza knows neither fear nor weariness. By studying the healthiest peoples of the world we might so improve our methods of health as to become a really healthy people ourselves.

The Hunza method of *returning to the soil what is taken from it* is of the utmost significance. The right nutrition of man is DEPENDENT upon the RIGHT NUTRITION OF THE VEGETATION he eats. The importance of the method of culture of food is primary, radical and fundamental in the matter of health. It exceeds all other aspects of nutrition because *what is not in the soil cannot be found in the produce grown* upon it.

Due to the faulty feeding of the plants we find in modern text books as many plant diseases as the list of human illnesses. The one is a counterpart of the other. Where the soil is sick, the vegetation is sick—the people are sick.

Disease is the censor pointing out the humans, animals and plants who are imperfectly nourished. Pests will not attack healthy vegetation. The policy of protecting crops from pests by means of poison sprays, powders and so forth is thoroughly unscientific and radically unsound; even when successful, this procedure merely preserves material hardly worth saving, says Sir Albert Howard.

The Hunzas are so remarkably healthy. Why? Because *they return to the soil* everything that received sustenance from it. Leaves, brick dust, ashes, stubble, paper, shavings, sawdust, old canvas, old leather, silt from the bottom of a water course, even the human sewage made into a compost kept over a period of six months. Allowed to go thru a process of fermentation finally the mixture becomes a rich complete fertilizer which is pulverized and spread upon the land.

It is gardening in which *everything* that has once had life, even ash and rag, offal and refuse, is brought back to life by the resurrecting power of the soil.

Please mention ORGANIC GARDENING when answering ads.

Organic Gardening

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With The Editor

Is Our Health Related to the Soil?

A Speech Delivered by J. I. Rodale to the Allentown Schoolmen's Club, May 29, 1946

THE idea that our health could possibly be related to the soil is an extremely radical one. It hasn't been discussed much in medical literature. It isn't recognized as important by your family physician. It isn't taught in high schools or colleges. If you would ask the Department of Agriculture—Is our health related to the soil? It would answer—Yes—but from that point on they and I ride on different trains. They actually believe that to obtain health from food, you have to use chemical fertilizers to build up the soil's fertility. I shall try to show how ridiculous that attitude is.

But you cannot blame the Agricultural Department for not knowing the real answer. It is held down by Congress. Like all other departments of the Government, it operates by means of appropriations voted each year. Congress appropriates so much for research to increase farm yields, so much for trying to reduce plant and animal disease, so much for this and so much for that, but not one penny does it provide for the Agricultural Department to bother its head about whether the food that the farmer produces could be so improved that the eating thereof would benefit or improve the public's health. Besides that, modern so-called scientific farming methods, that is, the use of chemical fertilizers and poison sprays, have brought with it such a train of evils, with regard to plant and animal diseases, that the department is wallowing helplessly in a morass of troubles, and its scientists are at their wits ends trying to cope with them. So there isn't much time left to experiment with the human health angle. But fortunately others are dealing with this subject and I will try and give you an idea of what is being thought about this question by them.

About five years ago I read in an English health magazine an article describing the work of Sir Albert Howard who over a period of 30 years in India had discovered that the use of chemical fertilizers was devitalizing the soil and the food that was grown in it.

As a mycologist in the West Indies Sir Albert had an opportunity to study the diseases of sugar cane. He came to the conclusion that the existing methods of scientific research where specialists learned "more and more about less and less" and where the researchers were lost in little cubby-holes, playing around with experiments in flower pots, would never

solve the problem of plant disease. When, in 1905, he was appointed to the coveted position of Imperial Economic Botanist to the Government of India he decided upon a daring course of action. He would get out of his cubby-hole and break away from the traditional method of using pocket-handkerchief plots for experimental growth of plants.

For years in the West Indies he had been thinking along revolutionary lines. He believed he had found the basic cause for disease in growing plants, but to prove his point he was going to be practical and apply his theory on a farm scale, not in little glass tumblers. He experienced trouble in getting the higher-ups to agree to such an unheard of practice but finally, after stubbornly adhering to his demand, he obtained 75 acres of land with sufficient money and with no restrictions of any kind to hinder his contemplated course of action.

His theory was, not to wait until the plant got sick, not to use the artificial method of spraying poisons to prevent disease organisms from taking hold in the plant, but to endow the plant with such strength that it could resist disease.

He had an instinctive feeling that the use of chemical fertilizers was doing more harm than good, that it was destroying the life, the vitality of the top-soil, that it was merely a "shot-in-the-arm" that gave you a momentary spurt in yield but struck back viciously in bringing about conditions later that actually invited disease.

Around his farm Sir Albert kept a close watch on the methods of the natives and saw how careful they were that all animal and plant residues were returned to the soil. Every blade of grass that could be salvaged, all leaves that fell, all weeds that were cut down found their way back into the soil, there to decompose and take their proper place in Nature's balance sheet. Your modern scientific farmer, with proper coaching from the professors in the agricultural colleges, says this is too much work and would rather buy a powder made in a factory which comes in convenient bags and which he can apply in no time at all. But, the big difference is that disease visits his crops with unfailing regularity, whereas the crops in the region surrounding Sir Albert's experimental farm were practically immune.

Sir Albert wasn't surprised when he observed a gradual lessening of disease. He was amazed however, that when his oxen rubbed noses with other cattle that had the dreaded hoof-and-mouth disease they did not contract it, in spite of the fact that they had not been inoculated. Their bodies had become strengthened and could fight off dangerous disease organisms because their food came from a soil rich in living humus matter, that had not been defiled with dead chemicals. Sir Albert sums up his work with the classic statement, "Artificial fertilizers lead to artificial nutrition, artificial animals and finally to artificial men and women." Another author put it in a different way. He said "The only crop that can be raised on poor land is poor people."

The Chinese do not use chemical fertilizers. They return to the land every bit of organic matter they can find. In China if you burned over a field, or a pile of vegetable rubbish, you would be severely punished. There are many fantastic stories as to the lengths the Chinese will go to get human excremental matter. A traveller told me that while he was on the toilet in a Shanghai hotel two men were waiting outside to rush in and make way with the stuff. The Chinese have suffered from overpopulation and lack of rainfall, and in many cases, the stuff is put on the land before it is decayed properly, otherwise the health of the Chinese might approach closely to the highest average level. However, they have maintained their soil for 4,000 years, whereas in the United States in only a few hundred years

an alarming proportion of our farm acreage has had to be abandoned.

What really got me excited in that original article that introduced me to Sir Albert Howard, was a description of a feeding experiment in a boys' boarding school near London where the students ate foods raised with compost made by Sir Albert Howard's method, a method that had taken him thirty years to perfect. Formerly, in the days when artificial fertilizers were used on the school's farm, cases of colds, measles, and scarlet fever used to run through the school. Now they tended to be confined to the single case imported from the outside. The number of colds was reduced tremendously. Further, the taste and quality of the vegetables definitely improved.

There was another school in New Zealand that tried the same experiment. The Lancet, famous English medical journal reported on it as follows, "In 1936, Dr. G. B. Chapman, of the Physical and Mental Welfare Society of New Zealand, persuaded the authorities of a boys' school hostel to grow their fruit and vegetables on soils treated with humus. This has since been done, and a striking improvement is reported in general health and physique, particularly as regards freedom from infections, alimentary upsets and dental caries." Even the N. Y. Times on June 30, 1940 discussed this case, identifying it as the Mount Albert Grammar School.

The Times said, "Dr. Chapman advised that a change should be made from vegetables and fruits grown in soil fertilized by chemicals, to produce raised on soil treated only with humus. The results were startling. Catarrh, colds and influenza were greatly reduced and in the 1938 epidemic of measles, the boys had only mild attacks whereas new admissions succumbed readily."

I had been editor of a magazine called Health Digest and immediately saw that Sir Albert's findings made common sense, so it didn't take us long to buy a farm and for the last four years about 40% of our diet has been produced on our own land by the organic method and there is no question that our whole family has benefited by it. My eight year old daughter, Nina, during the school term just finishing was chosen as having the finest teeth in her class. My dentist hasn't found a cavity in my mouth for over three years. My incidence of colds is only about one-fourth what it used to be.

Lady Eve Balfour, a devoted disciple of Sir Albert Howard, wrote a book describing the organic method of raising food called "The Living Soil." In it she says, "I have lived a healthy country existence practically all my life, and for the last 25 years of it I have been actively engaged in farming. I am physically robust, and have never suffered a major illness, but until 1938 I was seldom free in winter from some form of rheumatism, and from November to April I invariably suffered from a continual succession of head colds. I started to make compost by Howard's method using it first on the vegetables for home consumption. After harvest I saved some of my wheat crop from a field which for several seasons had received only farmyard manure. This I ground, just as it was, on the ordinary farm mill kept for grinding grain for livestock. Thereafter, in place of the baker's loaf, I ate home-made bread baked from this home-grown, home-milled, whole wheat. That winter, (1938-1939), I had no colds at all, and almost for the first time in my life was free from rheumatic pains even in prolonged spells of wet weather."

I believe I have produced sufficient evidence to show that there *is* a possible connection between our soil and our health, but I am not going to ask you to accept it, hook-line-and-sinker, until I start from the very beginning and show you why chemical fertilizers are an extremely negative factor in the consideration of soil fertility and its relation to our health.

(*Continued in next issue*)

The Pioneer: A Forgotten Factor In the Farming of the Future

By SIR ALBERT HOWARD, C.I.E., M.A.

(Continued from last issue)

It was now possible to consider how best to use the restored property. This brings us to *Charter for the Soil*, which shows how the consumer public in this country can be brought into contact with a fertile soil in such a manner that the national food supply can be improved beyond belief, our expensive social services re-organized and cheapened, a lasting liaison between town and country established, and above all our future national policy based not on money and on profit but on food. Mr. Drummond shows how a new unit in food production can be created, each unit consisting of ten self-contained farms of 150 acres as the optimum with 130 acres as the minimum size and 180 as the maximum. These he calls flavour farms. Their purpose is to produce from humus-filled soil high-quality milk, potatoes, vegetables, fruit, as well as some of the meat required by the population. The marketing of this produce will have to be on new and original lines. A new type of shop—the flavour shop—will be needed where the housewife could purchase fresh high-quality food put up in suitable units and attractively displayed. In this way the dream of fresh food from fertile soil could be translated into reality—the first steps for the re-birth of Great Britain as a great and powerful nation will have been taken.

The full scheme has therefore only reached the halfway house. The Megginch property, in spite of all obstacles, has been re-organized and the landlord of to-day has become the owner-farmer of to-morrow. The project must now be completed by means of a model flavour shop. No doubt in some future book Mr. Drummond will tell us that this very promising project has been translated into actual practice. Fortunately large centres of population such as Dundee, Edinburgh, and Perth are all to be found within a short distance of Megginch Castle. Now the war is over it should be possible to find the money, the materials, and the labour to put on the coping stone to a great and promising enterprise.

A great incentive for the creation of groups of quality farms and quality shops has been provided by President Truman's decision to terminate the Lease-Lend arrangements made with the United States to help this country to devote her full energies to winning the war. The grow-more-food policy of 1939-45 left us some 30 per cent. short of home-grown food, largely because the man-power available and the live stock population did not permit all the straw to be made into muck. But demobilization will soon make good the shortage of manpower, the mechanization of the muck heap will enable us to multiply our supplies of muck by at least three, the subsoiler—by breaking up the pans under the top soil—will help to remove any shortage of minerals such as phos-

phates and potash. Ground limestone will sweeten the soil, soured by copious dressings of devil's dust, and so finally help it to manure itself by creating the conditions needed for nitrogen fixation.

But all this needs the magic touch of the pioneer. We must see to it that our pioneers have a square deal: the hard roads over which all pioneers must always travel must not be made impassable by jacks-in-office on the spot or by their masters, the farmers of Whitehall. All the lets and hindrances which officialdom always seem to create can, however, be overcome by a very simple expedient—the right of appeal open to any future Coke of Norfolk or Robert Bakewell to an independent tribunal before which they can lay their plans and plead their cause. Had such a tribunal been available when Mr. Drummond had to cope with revenue officials and with War Agriculture Executive Committees, it is fairly certain that he would have been given time to work out his own salvation in his own way without more than a periodical inspection of his accounts and of his efforts by some carefully selected and unbiassed arbitrator of the calibre of a High Court judge. Any tenant accused of bad farming and threatened with dispossession has now the right of appeal. How much more necessary is it for the pioneers in farming, on whose efforts in the past British farming has been built, to be able to do the same. The mere fact that such a court of appeal lay open to our future Cokes of Norfolk and Robert Bakewells would also bring home to our officials the need for the exercise of caution and consideration in dealing with the man of genius like Mr. John Drummond.

So much for what a landlord can do. But what of the small farmer? The system of grouped farms, each group with its flavour shop, provides ample openings for the smallholders who wish to run and to own a larger farm. Full details of how this can be accomplished are given in the above-mentioned books.

But what of the prospects of an ambitious land worker? These will find their greatest openings to begin with in getting our vast areas of marginal land into good shape. The story of George Henderson, who began as a land worker and ended as a prosperous owner-farmer, is told in *The Farming Ladder* published recently by Messrs. Faber and Faber. Before starting as a small farmer on a semi-derelict holding in the Cotswolds, Mr. Henderson began by acquiring first-hand experience of many types of farming all over the country. This he did by the judicious selection of employers who were masters of their subject. He took off his coat and worked under a series of such men, staying long enough in one place to pick up the threads and understand the various types of crop production and animal husbandry practised in Great Britain. At the same time he saved the capital needed to begin as a small farmer. Joined by his brother, he soon made a worn-out corner of England into a prosperous farm and, moreover, into a place of pilgrimage where young men willing to work and eager to learn could sit at his feet and, it is to be hoped, copy in due course the striking example their teacher has created.

The land workers of this country are now organized on Trades Union lines. We read much nowadays of their efforts to raise their wages and to improve their housing. But they do not appear to publish very much about the way they are combing such areas as Scotland, Wales, and Northern Ireland for potential George Hendersons, then publishing lists of suitable farms where these men could work and learn the actual business of agriculture, and afterwards encouraging and helping them to take up and make over the derelict areas which now abound in all parts of England. It has been truly said that the main export of Scotland is Scotsmen. The same is true of the Welsh hills and Northern Ireland. The neglected areas of agricultural England are crying out for George Hendersons: the potential

Cokes of Norfolk who intend to copy and then improve on what has been done at Megginch will always be willing to find work for any George Hendersons waiting to take up holdings of their own. It would be interesting to know, for example, what has been done by the National Union of Agricultural Workers to distribute copies of *The Farming Ladder* to its local branches and to see that this book is available in all our rural libraries.

The need for the inclusion of the pioneer landlord, the pioneer farmer, and the pioneer land worker in all our future schemes of food production needs no further argument. It is obvious. The work of such pioneers will not end in the examples it will create. It will act not only as a stimulating pace-maker for the new official Advisory Service, but will also provide it with much useful material for its propaganda.

Do You Want To Help the Organic Cause?

WE ARE WORKING on a plan to enlist the aid of some of our readers who have the time to distribute our subscription-getting booklets and bring our message to an ever-widening circle. To those who are interested we will send a packet of booklets. Each booklet contains a coupon and a means of identification so that when a subscription comes in we will know through whose efforts it was, and will pay a liberal commission for every such subscription.

You can give them out to friends who do gardening or farming. Perhaps some friendly seed store, or church will aid you, or a garden club. Just give the books out—you needn't give them a sales talk, or follow them up. The booklet tells the whole story.

Within a month, since we have put this plan into effect, the efforts of reader-subscribers has resulted in our receiving 160 new subscriptions. Others who have spread our message with this easy plan have turned a few minutes of their spare time into handy spending money. Perhaps you can do the same.

Write for full details to Organic Gardening—Dept Q, Emmaus, Pa., and state whether you want 25 or 50 booklets.

COMPOST AND ROSES

I like your Organic Gardening very much. I made a small compost heap and used it on rose bushes; it made a wonderful improvement. I am moving out on 3 acres soon and intend to go for compost in a big way.

C. A. Morrow,
Antioch, Calif.

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STRAWBERRY RESULTS

This year really paid dividends, receiving about 80 quarts of the choicest STRAWBERRIES I ever picked. Really began for this year's crop about 18 months ago, plowing deeply sod land and clearing of grass, with a rotary plow, which mixed the trash, weeds, and old grass, with a heavy dressing of dairy fertilizer. Then after the plants were set, applied two applications of compost at intervals of several weeks; this seemed to melt into the ground, with light cultivations. Applied sawdust, shavings and old partly rotted hay; this, too, seemed to melt into the ground. Had a few sample berries last year while the plants were becoming established and putting out runners for this year's crop; and what a crop—four 50' rows, well matted, really produced. One row was of the everbearing (Gem) and was too thick, but I didn't have time to thin out, so had a few mouldy berries, as there were too many leaves and shaded too much in the thickest stand. Try to improve on that next year. Have now split down the middles of each row, plowing out about half the plants, and will thin out to a uniform stand, which should put out a lot of runners to have a good prospect for next year's crop.

Wish the whole world would pay more attention to organic gardening than to hospital building. If they did, they would not need the hospitals.

J. O. Hammond,
Dallas, Texas

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A COMPOST PROGRAM

Although I have only a small garden for vegetables and flowers at Westhampton Beach on the south shore of Long Island, I am very anxious to put into practice the scientific composting described in "Pay Dirt".

In speaking to a Long Island potato grower about the injurious effects of commercial fertilizer and the advantages to be gained by using compost, he pointed out that potatoes had been successfully grown on Long Island with chemical fertilizers for many years. My question is, could not potatoes be grown on Long Island *more* successfully with compost than with commercial fertilizer and at the same time cut down the damage by potato bugs which necessitate so much spraying? I have been gardening on Long Island for the past twenty-five years and have had considerable interest in watching the potato farms on the North Shore where commercial fertilizers are used so extensively.

I hope to experiment myself with growing potatoes solely by compost to see if I do not get better results than from using chemicals, particularly as to reducing the attacks on the plants by potato bugs.

Hugh A. Ward,
New York City

CORN STALKS

In past issues of *Organic Gardening* I have come across references to the difficulty of composting corn stalks. With that in mind I write to inform you that last fall I placed corn stalks in my compost pile, both dry and green, and that they are now completely digested. The secret, which may be of interest to others, apparently lies in the fact that I cut the stalks in pieces about two or three inches long before placing them in the pile, doing the cutting with a hatchet and block of wood, a little each day, thus disposing of all my own and a generous supply from a neighbor. For a home garden the task was not at all arduous. For any quantity an ensilage cutter would probably be the answer. In any event, the added interior surface thus exposed seems to supply what is needed to eat up the corn stalks when mixed, as in my case, with poultry manure and the household garbage plus ground limestone and a sprinkling of earth.

G. A. Nelson,
Garden City, L. I., N. Y.

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THE CHEMIST

I, as a professional chemist and a lover of gardening and the problems of a farmer, am greatly interested in your magazine. I own 5 acres of land in the country and have lived there 10 years. My hobby is gardening and raising chickens. I have tried various methods of raising crops and realize that chemical fertilizers are not good for the land although yields are high. I have very clayey ground and find it needs much compost to loosen it up.

Name withheld,
Toledo, Ohio

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BEEKEEPER'S LETTER

We cooperate with Iowa State College in their project showing the value of Honey bees as pollinators of red clover. Last year ours was the only good clover seed crop produced in this locality. Neighbors adjoining had some, but our own field located close to the apiary produced 3 bu. per acre, which is a heavy yield for Iowa in even a good clover seed year. So you see we are immensely interested in the comparatively new interest shown in using natural means to our advantage in farming of which gardening is only one branch.

Mrs. Elmer Timson,
Independence, Iowa

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THE QUICK COMPOST OF COLOMBIA

Some time ago you asked me to write you and tell you something of the cultural methods used in this country. I am sorry but there is not much to tell as there is not much in the way of agriculture in this part of the country; what grows here does so more or less in a wild state. We have bananas, oranges of a sort, cocoanuts, limes and so forth, all growing "as is" and belonging to whoever grabs them and, with so many people as we have here in this small place—try and get some! Most of our vegetables are brought in to market from the higher land and are pretty well dried out by the time we get them. I have tried several times to grow tomatoes with varying success, but do have good papayas, melons and cocoanuts. Orchids do well providing the iguanas don't see them first, also zinnias and a few other flowers from the north do well here but I am anxious after seven years here to get back up north and "go to town" with the organic stuff. I have tried several times to make compost here but each time *the whole pile is completely decayed in a month* so I don't know whether I have good compost or not, it looks good to my untrained eye but "Quien sabe". One might sum the whole matter of agriculture in these parts as "stick the plants in the ground and hope they grow".

I hope I have conveyed to you the prospects in the red clay that we have, which, by the way, is where the name Barrancabermeja comes from.

J. H. Browning,
Barrancabermeja,
Colombia, S. America

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FIGHTING IN A GOOD CAUSE

I sent one of my compost-books to the Superintendent of Parks and he was pleased to get it. And from time to time I have had articles written on the subject published in the local papers. But nothing came of it and the loaded trucks filled with everything necessary to make it still is burned and lost to the people every day in the week. While the use of chemicals is increasing each year. Phoenix' hot sunny streets need shade trees desperately but for such a marvelous climate it is shameful how few we have.

But we have hundreds of dead trees standing stark and useless and infested with insects and diseases but they will stand for ever when they should be torn up and cleaned out and new ones planted. I am enclosing the letter I received. Our city parks are beautiful with deep green grass growing summer and winter. Because the grass is grown with compost, rabbit owners get the clippings for their stock.

Mrs. W. J. Heinauer,
Phoenix, Arizona

REMEMBERING GRANDFATHER

A note of thanks is all too inadequate to express my gratitude for pointing the way and furnishing the encouragement needed to change my garden operation from the artificial fertilizer way to composting.

When moving from city to country nine years ago I had ignored memories of how my very successful gardening-grandfather had always used only rotted manure, leaf-mold and lime. For five years I struggled developing a flower and vegetable garden layout on a rather extensive plan and finally had so much trouble with disease and bugs that I could not cope with the spraying, watering and cultivation.

Then I came across a copy of your magazine, and, remembering Grandfather's success, and tales of fabulous old time gardens in the family cultivated when the Little Miami valley was rich with woodland humus, I converted at once to the compost way. In the four years since my gardens have become disease free and practically bug free. Flowers and vegetables I grow are splendid, indeed.

I am truly grateful to you, Mr. Rodale, and to your magazine.

Mary C. Wersel,
Newton, Ohio

Chemical Weed-Killers and Soil

ONE OF THE CHEMICALS used for destroying weeds, known as 2, 4-D, sold under different trade names, is so strong that 1 part of it in four and a half million parts of moist garden soil can prevent or seriously retard the germination of seed in a greenhouse, as Dr. Mitchell and Dr. Marth of the Plant Industry Station in Beltsville, Md. found out. This dangerous quantity is much less than the 1½ pounds per acre ordinarily used to kill weeds by sprays.

Garden Calendar --- August

North Temperate Zone: For Vegetables see our article in this number.

For Flowers—while I prefer to start perennials earlier to give them a good start so that they winter more easily, it is good practice to sow now if you have a coldframe which will protect tender seedlings. On the other hand, many tender plants can stand winter weather perfectly well if they do not germinate at the last minute. Pansy seed, mignonette, petunia, and even tomato seed frequently stay viable throughout the winter. Larkspur, California Poppy, candytuft, forgetmenot, daisy, and hollyhock usually do.

Make cuttings, take this year's growth when it has begun to harden at the lower end. You can also propagate fresh and juicy cuttings, but these require more attention.

Make cuttings of carnations, wall-flower, petunia, geraniums, fuchsias, and others for window plants in winter.

Pot other annuals.

Divide and transplant perennials that have finished their growth. Plant lilies. Many lilies can be planted as late as December if the ground stays open. Transplant flowering shrubs, make new strawberry beds, order lawn seed for fall seeding.

The best lawn care starts before seeding. Plow and cultivate, apply topsoil and compost and let the weeds germinate. Then you cultivate the top few inches and destroy the weed seedlings. Leave the soil a bit rough and sow the lawn mixture that a good seedsman has for your type of soil. Water the ground and let the grass come up. Roll after this stage. If you make a smooth seed bed you run the risk of getting a hard crust and get washing under a heavy rain or thunderstorm. A rougher surface will catch the run-off, produce better germination, and smoothen out naturally.

When you repot house plants that have been in the open, you may have to trim the roots. Loosen the pots that are in the open so that the plants can stand the shock of removal.

Continue pruning especially with cane fruit, such as raspberries. But you may also do so later, especially with blackberries.

In repotting and planting use mixtures of good garden soil and well-made compost. Watch out that acid-loving plants have enough leaf mold or raw humus from the woods and are not given compost made with lime.

Southern Gardens: For vegetables see our article in this number.

Toward the end of the month you can start the garden as a Northern gardener would in spring. All the early and cool weather crops must now be started, and the flowers that you want for winter and spring bloom can be sown.

Calla, oxalis, German Iris and similar bulbs can be set out. Use also some of the bulbous irises if your climate permits. Try some of the new daylilies which are superior in form and color.

Iris and Violas McFarland

The Inexhaustible Iris Family

By HEINRICH MEYER

AUGUST is the time when Iris shipments start, for the plants have more or less completed their growth cycle and stored adequate nutriments in their thickened roots, the so called rhizoma, or in the bulbs. With few exceptions, the irises with rhizomas grow anywhere and in any kind of soil, provided it is not too rich in raw humus or leaves or plainly alkaline, like seashore sand. Even there, the majority make some show. The bulbous Irises are different, because they originally come from the warmer regions of the Near East, the Mediterranean countries, and North Africa; thus they demand a warm and dry rest period and do best in the Southern climates of America. Such bulbous Irises are the Spanish Iris (*Xiphium*), the dwarf variety with chive-like leaves, *reticulata*, and the more nervous ones, so to speak, like *caucasica, orchioides, alata*. The catalogues offer three more or less hybridized kinds, the Dutch, Spanish, and English Irises. Not that they are really hard to grow in the North if you want to go to the trouble of digging the bulbs up and drying them for a while in the late summer before replanting them in fall for next year's flowering, still they are not so simple as the root-stock irises, both bearded and beardless kinds, among which the Siberian Iris, the Kaempferi, the humilis, the Yellow and Blue Flags, the German Iris, the tall Bearded Iris, the Crested and Wall Irises are offered in sundry catalogues.

These Iris catalogues are more or less self-explanatory, except in terms of prices. If you want a novelty which has just been introduced, you will have to pay for it just as though you ordered an all-plastic car. The breeder who asks a relatively high price for his introduction has gone through several years of work before he has even a small number of roots for sale. He hybridized some plants, grew the seeds until they became of flowering age, threw away hundreds of undesirable specimens, checked on the performance of the good-looking ones, and then increased those by root division. You may buy an old variety for as little as 15 cents, though the average price is closer to 30 cents, while a new introduction may cost you $7.50 to $15.00. The breeding of new irises is already becoming somewhat specialized, one breeder going for deep dark colors, another one seeking to develop almost translucent sea shell tints, that look like or are pink.

Iris fanciers have noticed that the best varieties of the last few years show the characteristics of tall or dwarf growth more clearly than the earlier introductions which kept closer to medium size. If you want tall showy plants, newer varieties are indicated; if you are satisfied with an iris of 18 to 30 inches in height, you will find an infinite number of splendid old names. As to color variations, there really is hardly a limit. I personally regret the trend toward so much mixing, just as I do with columbines; the light colors which have been bred into the oldfashioned, short-spurred columbines of strong simple colors, and into the good self-colored irises make a gaudy display, but may easily look artificial if you don't have a sufficient

number of simple colors for balance. It is generally suggested to use white, but you could equally well arrange around a predominant note of blue and purple. Fundamentally, the colors are white, yellow, blue, and purple; the mixtures and blends of these have apparently developed in nature and have now been increased a thousandfold by the breeders. The number of breeders and growers is by no means small, and many catalogues give the name of the originator behind his introduction. You will find the names of Dykes, Jacob and H. Sass, Mohr, Nesmith, Loomis, Thomas, Kleinsorge, Salbach, Hall, Kellogg, Tompkins, Kirkland, and many others equally well-known and successful. And if you want to keep in touch with the progress, you will join the American Iris Society, which publishes a *Bulletin* at 32nd and Elm Ave., Baltimore, Md., and keeps its members informed on new and old iris questions.

One aspect of Iris gardening many gardeners have failed to appreciate is the fall-blooming iris, which really blooms twice. Varieties that have done well, after they have become well established, include the purplish *Autumn King,* the white *Autumn Queen,* and the yellow *Peggy Babington.* Others of equal merit are *Equinox, Eleanor Roosevelt, September Skies,* etc. You need not expect a magnificient display the first year, but you can look forward to two iris seasons after that.

Another matter about Irises, hardly recognized by half of those who grow them, is the scent. There are numbers of highly fragrant irises which might be grown just as well as those others which excel merely by brilliance or variety of color, shape or size. *Dazzler* is an easily available scented iris and *Dorcas Hutchinson* is one among the fall-flowering kind, but this, by no means, exhausts their number. Too few gardeners avail themselves of fragrant flowers. Yet, you could keep a garden covered the year around with nothing but fragrant plants. True, some irises have their main blooming season about the same time as the earlier roses, but since they follow naturally upon the fragrant daffodils and since they are hardly planted near the roses, but can easily be put in the same border as the daffodils, you will have a succession not only of flower and color, but also of scent.

This brings us to the question as to where we can plant irises. The dwarf varieties go well on a wall or in the rock garden, but the standard bearded irises require ample space. I have seen many gardens and lawns bordered with a straight iris border and nothing else. This makes a startling display in May and then . . . well, then you have pretty iris leaves sticking up for a few months. Personally, I am against planting anything in a row unless there is a very good reason for it. Since the irises, once planted, are not likely to be uprooted for many a year and since therefore they should be able to spread out and form clusters, I can see no good reason for first planting them in a straight line. When

Iris Kaempferi **McFarland**

you get three or four good flowering stalks for every clump, you can start dividing these by pulling the loose outside rhizomata off. These will then have become individual plants and may be used for new beds. Cover the rootstocks with earth and leave the rest to the snows and winter rains and their washing action: before spring the rhizoma will be close to the surface or show clearly as it should. For most irises bloom best when the light strikes the thickened rhizoma, just as light must draw out the flowering stalk from the amaryllis bulb. All these things must be considered when you plan your original bed or border. You cannot grow the irises between quick growing perennials or too close to plants that will be mulched. You want to let them spread and therefore must not crowd them between other spreading plants.

What would make a good iris border? I should start out with the self-colored ones and mass a good group of tall and small purples, three or four clumps deep and at least five clumps long. This does away with the artificial look. Next to them you might have a group of wall flowers, both purple and golden, to lead the eye along to a group of peonies. With ranunculus you then lead up to another group of self-colored iris in the yellow tones. By placing white and golden daffodils and mertensias in a drift in the same bed, preferably in front, and tall tulips behind you have much reliable flower display before the tall irises start. If you emphasize the red color in the tulips and place late yellow tulips close to the purple irises, you will temporarily get a further interesting and pleasing play of colors. If you balance daylilies and funkias in clusters between the iris and peony groups you have a perennial succession to the wall flowers. When the latter have finished blooming you can replace them with snapdragons, which you can mulch over winter and make last for two years.

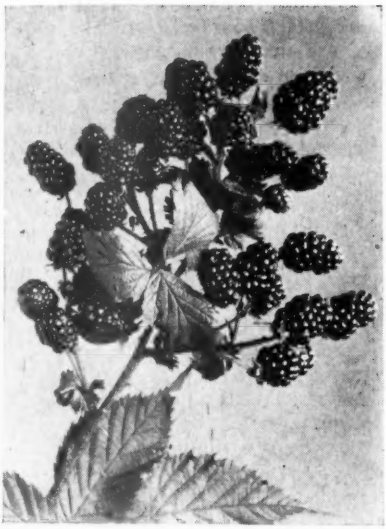
Spring Border McFarland
Iris *Solidad,* followed by Azalea Amoena, and Tulips.

Should you like the many-colored irises better than the self-colored ones, the problem would be a bit different, since you would have to find a harmonizing principle, which means a dominant color of white, yellow, purple or light blue in addition to the composite-colored plants. These take up space and you must rely more on annuals for balance, unless you make a narrow iris bed follow a winding and irregular shrub border. To place the new long-spurred and vari-colored columbines between vari-colored irises is almost impossible, because they may come in bloom at the same time and ruin each other's effect, but the self-colored columbines, especially dark purple and red ones can help you in bringing about some color balance. Still, you will need blooms before and afterward, which is always a difficult problem since flowering periods tend to overlap. I have never tried it, but think annual larkspurs would not be a bad flower to give unity to the many colors of a varied iris border. And if the bed is sufficiently cool and shel-

tered from the sun you could attempt a planting of vigorous begonias for the time when the irises are nothing but leafy swords.

The possibilities are almost unlimited. At one time I interplanted anemones and irises and thus had the graceful flowering heads of the windflower waving when the iris leaves were storing food reserves for next year's flowering season. The irises crowded the anemones out in due time, for they are not only vigorous growers but the least exacting. They are therefore the easiest to handle for the beginner and yet, for the expert, quite tempting. They are indispensable to all gardeners. If a succession of Irises is desired, he can have it from March till June and again in fall, and naturally in various combinations. You could not grow the graceful crested iris of the half-shaded, shrub-overhung wall garden with portulacas; but you could make it easy for the main group of bearded irises to expand by sowing summer-flowering annuals among them, and the portulaca would in that case be quite suitable. By choosing the iris, as it were, for the backbone of the garden perennials you could develop a most original, and yet quite tasteful, planting arrangement.

Dwarf Iris between Rocks McFarland



Blackberry McFarland

Hints for the Home Fruit Grower

BLACKBERRIES

By ROGER W. SMITH

NO matter what you do with your garden it remains intimately associated with the surrounding fields or weedy lots; it is a part of these, and your estimate of which fruits will succeed in your garden must be largely based upon which wild fruits thrive in your neighborhood.

It may be true that rugged, wild blackberries growing near a plantation of cultivated blackberries should be removed to prevent the infection of the more delicate plants with diseases which the wild varieties easily withstand; it is equally true that if wild blackberries do not thrive in your locality, the culture of the domestic sorts will often be difficult.

A few hours spent in observing the wild bushes around your garden will often serve as a key to just which kinds of fruits will do best in your garden. Before you attempt the planting of blackberries, you might find it worth while to look over the garden fence and to note the habits of growth of the wild blackberry.

The wild blackberry took advantage of the ravages of modern civilization. Originally, much of our country was covered with dense virgin forests. The edges of these forests were thick with that type of *rubus* which we call the blackberry. Around many of these virgin forests blackberry vines formed a dense and almost impenetrable hedge.

In many wide areas the pioneers cleared these forests or portions of them. Such clearings increased the mileage of the forest borders and for many years the chief natural cover of the cleared land was forest-edge plants especially the blackberry. Such clearings also made possible the growth of seedlings which sprang up from seeds dropped by blackberry-eating birds, etc. It made possible

the growth of an infinite variety of hybrids which would never have succeeded under normal forest conditions.

The pioneers found, as you might find, fine wild blackberries growing on the other side of the fence. Until quite recently most blackberries were grown from plants found in the wild. Most improved varieties are derived from wild types common to temperate climate, often they are unable to withstand the rigors of the north-east.

If you keep in mind conditions as they exist at the forest-edge and on recently cleared land—the heavy layer of organic leaf mold, the partial shelter from high winds, the heavy accumulation of organic debris—you will see why blackberries ordinarily develop shallow root systems and under culture suffer very much from lack of soil moisture during both the dormant and fruiting seasons.

Because of its shallow roots, deep cultivation is dangerous. Blackberries planted in hot, exposed spots suffer excessively from the drying out of the surface soil. Drought should be avoided quite as much as excess moisture; you can see why this is so. Blackberries suffer particularly from drying winds for they know only the shelter of the forest. Blackberries do best on sheltered high land rich in organic humus and having ample air and soil drainage.

All of which doesn't mean that you have to go off into the hills to find a place for your blackberries. A bit of sloping land on the sunnyside of your barn or garage might be an excellent spot, especially if the gutters are so arranged that rainwater will be directed to the planting, somewhat as the rainwater which fell upon the forest-edge trees was passed on to the wild plants.

With an understanding of the nature of the wild blackberry you will find that it is possible to grow blackberries successfully on almost any sort of soil provided that soil contain sufficient humus so that the roots of the plants are never out of reach of rich plant food. Sandy loams containing much organic matter are, of course, to be preferred to clay soils mainly because they are mellow and their organic matter more easily available. The subsoil of sandy loams is usually such that it permits deeper root penetration than a heavier soil will allow.

The place you select for your blackberries, whether from choice or necessity, should be used as an ordinary garden the first season. It should be dug and the turf should be turned under in the fall; the whole area should be cultivated and set out to garden crops to mellow the soil before any attempt is made to set out blackberries. With a picture of the background of this plant in mind, you can see why this should be done.

After the garden crops have been harvested in the fall, the site should be covered with as much organic humus as you can spare. This should be deeply dug in. If you have discovered by the growing of garden crops that the subsoil is poorly drained, it might be well to have the area gone over with a sub-soil plough.

As early in the Spring as the soil can be worked the new plants should be set out. The earlier the better. The thing to bear in mind is moisture. Early set plants are more likely to find moisture around their roots than those later planted.

Planting distances vary considerably with types. Erect-growing blackberries are usually set five feet by five feet each way. The distance is often increased to seven by seven; often the rows are spaced eight feet apart. Under such conditions little hand work is necessary to keep down weeds and suckers since horse or tractor-drawn cultivators can do the job.

Just as soon as the berries have been picked the old canes should be cut out so that the young canes can find room and moisture for growth. Methods of pruning vary because of different climatic conditions. In some

areas, where the canes do not become very tall and where there is no danger of soil erosion, the new canes may be pinched off when they are about three feet tall. This heading of the canes causes them to branch, grow sturdy and better able to bear the load of a heavy crop of berries. Some support is often necessary for the heavily loaded cane and to make the matter of the picking of the fruit more easy.

The method of support depends upon the type of blackberry and to what extent it is upright. Blackberry plants of the upright type may be supported by tying to posts using a post for each plant. More often the posts are set in pairs some twenty feet apart in the row. As a matter of economy, single posts with cross-pieces nailed to them, are used in place of two posts.

The height of the posts depends upon the height of the plant. Upon the type you grow and whether it is upright or trailing will depend the method of its support.

Old canes are usually cut off after fruiting and in the spring all spindly growth should be removed; laterals should be cut back. Varieties differ, but as a general rule, you will find it advisable to cut back the laterals of erect-growing plants to about eight inches in length.

In the Spring the suckers come up. They present a peculiar difficulty. If you don't cut them out they will soon fill your planting with fruitless growth; if you attack them too vigorously your plants will suffer from root damage. If you have a small place the best way is to pull them up by hand.

Suckers are valuable as material with which to start a new planting. Weeds and suckers can be kept under control by chopping off with a hoe. A heavy mulch is also valuable. A deep permanent mulch of organic humus will check rapid loss of soil moisture. Organic mulches have long been recommended to bring berry patches infected by disease back to health. Understanding the nature of forest-edge conditions you can see why this should be so. A heavy layer of mature compost humus not only keeps down superficial growth, it increases rather than shortens the available soil nitrogen.

Blackberries have become increasingly popular. They can be profitably grown in most north-eastern states. There are varieties suited to many wide sections. In the north-east, the Eldorado is well known; in southern California the Lawton and the Himalaya are valued; in Oregon and Washington the Evergreen and the Brainerd are the thing; in Kentucky, Early Harvest is a favorite, for Texas, Dallas, Early Wonder, and McDonald are recommended.

Just what is the food value of the blackberry? According to modern analysis the blackberry is a good source of vitamin A only. It is likely, however, that natural yeasts, the spores of which give the fruit its bloom have something to do with its food value.

The blackberry contains many valuable substances of which we know little. Often, during the Civil War, truces were declared so that soldiers might forage for wild blackberries. Blackberries were recognized as a preventative of dysentery and other digestive complaints.

If you have used the most popular kinds of plants your plants will stand four feet apart in the row with rows six feet apart. Most popular types of blackberries are:

Early Harvest, a very early.
Erie, solid, coal black.
Eldorado, jet black, large clusters.
Wilson's Early, a reliable old-timer.

Iceberg, originated by Burbank, the only successful pure white blackberry ever introduced. It bears well and will surprise your neighbors.

At harvest time you look over your planting, the sun is low over the hillside, by its slanting light your home gains dignity. The gleaming berries are yours for the picking; from your own fruit garden.

Cabbages

Dr. L. L. Dolson

Vegetables In August

By HEINRICH MEYER

THE Flower Gardener has long availed himself of autumn-flowering bulbs, such as Colchicum and Sternbergia, Japanese anemone, Tritonia, and the late phlox, chrysanthemum and aster species. But the vegetable gardener often misses out on fall and has unsightly beds or empty rows in the garden when he could very easily take care now that good succession crops supply his table with fresh vegetables for a few more months.

Succession crops should be planned early in the year not only for the purpose of getting more out of the garden, but especially in order not to have empty spaces which dry out. A good garden is shaded by growing plants most of the year, except in winter when it is exposed to the weather. If, however, foresight was missing in spring, we can still contrive to make a sound fall garden of vegetables.

The most important aspect is not so much the name of the vegetable as choice of the right variety. You need quick growers now, those seeds which are classed in the catalogues as "early", so that you may still get a satisfactory crop in the next three months or so. It would be foolish to sow pole beans; but many bush beans will be suitable. Carrots, turnips, rutabagas can be put out, also beets. And if you don't get gigantic roots, you will get tender and tasty ones. You can immediately sow summer and winter radishes and, before long, also start another crop of red spring radishes. The summer and winter radishes come in white, pink, and black varieties. The black ones are usually less pungent and more turnipy in taste than the crisper white ones, but keep better if you mean to store them in the root cellar or in a pit in the open.

Onions can be planted if you have sets or can pick some from your own seedlings. Multiplier onions, which may stay out over winter, can usually be secured from the dealers now.

Cress and spinach can be sown again. The curly cress is sometimes rather fidgety and does well only when it is neither too dry nor too wet, but the upland variety will do well under all circumstances and best where you have a moist spot. Zippy salads with a touch of cress will be just fine for summer and fall suppers and lunches. Corn salad seed is hard to obtain; if your seedsman has it, give it a trial. Corn salad is a member of the Valerian family of which the Garden Heliotrope is the best known. It has a fine flavor that remotely recalls the scent of violets. You may cut the little rosettes and leave the roots outside through the winter. Then you can raise your own seed next year by spring or early summer, since they will make another growth.

Spinach, endive, and lettuce are three other vegetables that can be resown. As always, I recommend the green butterhead type of lettuce rather than the harder varieties that the commercial growers produce because they must ship them some distance. Endive can be handled in two different ways: You can let it grow and eat it green in small quantities, perhaps after some leaching in luke-warm water which will extract the bitter sap. My preference is bleached endive. You tie the rosettes up with a thick cord or better a straw rope and get a mass of tender yellow leaves inside the bundle. This need be less severely leached. There will be a lower vitamin content, to be sure, but a better salad for those who like to eat goodly amounts of raw vegetables.

It may be a bit late for a second

Dr. L. L. Dolson

Cabbages

broccoli crop in the North, but if you want to take a chance on a late frost you may still sow some and perhaps get a few good meals out of a row sown right into the open. Kohlrabis will usually produce once more if sown early in August; so will some cabbages and especially the delicious Savoy cabbage which is rather frost-resistant. Kale is, however, the member of the cabbage family that *should* be sown now. In the latitude of Philadelphia and even farther North you can sow it as well as endive much later yet and leave plants or seeds out in the open. Endive stands the winter well if it does not germinate before the frosts, kale must germinate and get a good start. It may freeze off in winter, but will resume growth in spring and supply you with an excellent tender vegetable before next year's spinach. When then, coming spring, your spinach will be followed by the first lettuces, your kale will go to seed and can be thrown out.

A variety of Whitloof Chicory culture is sowing this vegetable now and treating it like endive for bleaching. Only, instead of harvesting the tops, you dig out the roots and put them in sand in the cellar. You will, however, not get the same results as when sowing whitloof chicory in spring, and I should therefore recommend, instead, immediate planting of the quick-growing green curled endive that should be ready early in October. The broad-leaf endive varieties take usually three months and will be too late for the Northern gardener, but ideal for the Southern garden.

The Southern gardener has before him still several months and, in the Gulf Coast states, almost until Christmas. You recall from previous years the first frost? It nipped the poinsettias just a day or so before Christmas. Well, this leaves you five months or enough time to plant all the vegetables you want from now until then. The trouble in the deeper South is, of course, that the next three months will be too hot for the ordinary spring crops and that you must therefore save your lettuce, spinach, radish, and endive plantings until later in the year; beets, cabbage, Brussels sprouts, parsley, and leek may succeed if you have a good mulch between the rows and if you can plant them along a hedge where shade and moisture conditions can be kept right for them.

And here is a list of early or quick-growing vegetable varieties for August sowing:

Endive: Green Curled, White Curled, Giant Fringed.

Beans: Green Pod, Bountiful, Tendergreen, Red and Black Valentine, Plentiful, Keystonian, Golden Wax, Asgrow Stringless Valentine, Tennessee Green Pod.

Beets: Detroit Dark Red, Early Flat Egyptian, Red Ball, Early Wonder, but *not* Winter Keeper, which is a slow grower, nor Long Smooth Blood, also slow.

Cabbage: Early Jersey Wakefield, Golden Acre, Elite Golden Acre, Early Round Dutch.

Savoy Cabbage: Perfection Drumhead.

Carrots: Early Golden Ball, Amsterdam Forcing, Touchon, Nanchan.

Tampala—a hot weather crop, eaten like spinach.

Kale: Hanover Salad, Blue Curled Scotch, Dwarf Siberian.

Lettuce: Early May King, and all the loosehead varieties for cutting, such as Oak Leaf, Slobolt, Grand Rapids.

Radish: Scarlet Globe, Giant Globe, Saxa, Cavalier, Sparkler (White Tip), French Breakfast, Cincinnati Market, White Straszburg, China Rose, Half Long Gray, Long Black Spanish.

Spinach: All varieties.

Turnip: Early White Flat Dutch, Purple Top, Early White Milan, White Egg, Red Top White Globe, but not the Yellow Globes.

Rutabaga: Golden Neckless, Long Island Improved Purple Top.

Fall Broccoli Raab: Makes top growth early in spring like the kales.

Kohlrabi: Early White Vienna, Early Purple Vienna.

Restoring Life to A Dead Farm

By F. NEWMAN TURNER

Goosegreen Farm, Sutton Mallet, Bridgwater, Somerset

WHEN I came to this farm, the first calf born was dead. That was the beginning of a long chapter of disaster. Disease drained my resources for five years, and nearly ruined two herds of cattle.

The fact that not all the cattle succumbed to contagious abortion led me to believe that it was not primarily a disease caused by bacteria, but a deficiency disease and the bacteria a secondary factor. The farm had been an orthodox dairy farm and the cattle had lived and produced milk on the same pastures for generations. They had been forced in the usual manner with concentrated manufactured foods. The more milk the cows gave, the less natural bulky food they were allowed to eat—what home-grown food they had was raised with artificial fertilizers. For my predecessor was a good farmer and the hall mark of a good farmer was a large artificial fertilizer bill.

I cogitated that Nature provides the means of combatting all the disease that any living thing is likely to encounter. So I decided to get my farm and its live stock back to Nature. I would manure the fields as Nature intended; I would stop exhausting the fertility of fields and give them the recuperative benefit of variety. My cows would no longer have to act as machines, with compound cakes going in at one end and milk and calves coming out at the other, but would become as nearly as possible their natural selves. The more natural parts of their diet—hay, green fodder, and roots—were assured and adequate quantities insisted upon before any concentrates were fed. All the food was grown on land filled with farmyard manure, compost, and catch crops. Artificial fertilizers were dispensed with entirely.

There was not enough muck to go round, but with the rapid ploughing-up programme adopted, straw was accumulating. Instead of tying up the cows in winter, they were turned loose in yards and milked in a milking parlour. Quickly the straw stacks diminished; not to disappear, but, by way of the cattle yards, they grew into tons and tons of compost which went to produce whole wheat for bread, whole oats and beans for cattle food, and fresh greenstuff for all the living things on the farm—soil, cows, and men.

Three or four years of this kind of farming have now restored life to a dying farm. Everything on the farm from the soil teeming with life to the cows all pregnant or in full milk, to the farmer and his family full of energy and good health, acclaim the rightness of this policy.

Many neighbours have questioned the financial wisdom of such a system of farming. They said labour for composting would be higher than the cost of buying and spreading artificial fertilizers, and yields could not possibly compare. Costs certainly did increase,

but so did yields. My threshing contractor tells me that my yields are not equalled in the district. Yet all my neighbours boast that they use all the artificial fertilizers they can lay hands on. They even take my permits if they get the chance.

But it is not in increased yields that I measure the success of natural farming, though this is important. It is the health of all living things on the farm that proclaims Nature's answer to our problems. From a herd riddled with abortion and tuberculosis, in which three years ago few calves were born to full time and most of those few that reached due date were dead, I can now gaze on fifteen healthy heifer calves born in the last four months and on cows, formerly sterile, now heavy in calf. And the herd has been attested for two years. Admittedly I have corrected glandular deficiencies in some extreme cases, but I am satisfied that no treatment would have succeeded without the basis of natural food grown on humus-filled soil. And I am also convinced that hormone deficiencies will not arise in the future when the full effect of natural farming has ensured a disease-free inheritance for the farm live stock.

In recent months cows that have been sterile for two and three years have given birth to healthy calves. On the orthodox farm there is no hope for such cases, and they are slaughtered as barreners. But Nature meant the cow to continue breeding to old age and, if she is fed as Nature intended, there is every chance that her breeding capacity will be restored. I have considered my pedigree Jersey cattle worth keeping and bringing back to production; and it has paid me both financially and in moral satisfaction. I have one cow aged fourteen years which, after being sterile for three years, is now due to calve next month. That is an achievement worth while and it is within the reach of all farmers who will turn back to nature farming and eschew the get-rich-quick methods which are but a snare.

Phosphates and Nitrogen

MANY RELATIONSHIPS exist between the different fertilizers and the compositions of crops. A plant grown on nitrogen-deficient land lacks protein. If you merely add phosphate rock you can increase the yield, but still will have a starchier grain low in valuable protein. In order to get high yields *and* good quality the use of legumes and organic matter supplying nitrogen is essential. H. F. Murphy discussed these problems in *Fertilizing Wheat for Yield and Quality,* Bulletin 285 of the Oklahoma Experiment Station. This recommendation fits in well with the program outlined by Dr. Parker as President of the American Society of Agronomy: "To a greater extent than the phosphate reserves, the nitrogen builds organic matter to improve the physical properties of the soil . . . There is great need for both fundamental and applied research in this field . . . Our knowledge of the chemistry of soil organic matter has not advanced as rapidly as that relating to minerals."

by H. K. MEYER

Over the Fence

FLORIDA GROWER, April 1946, had an item by Dr. Watson of the Florida Experiment Station, entitled *Cover Crops Fight Citrus Pests.* He is an entomologist and knows that, for instance, the Chinese Ladybeetle feeds on *Crotalaria striata.* Since the beetle devours aphids in season, the grower supplies him with crotalaria to nurse him through fall and winter. There are many other interesting facts on cultural methods. For in return we have also trouble from this crotalaria, because some other pests like it. To be on the safe side, these crops must therefore be mown when blooming starts.

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ONE OF OUR READERS sent us a clipping from *Better Farming Methods,* April 1946, by Irwin of Oklahoma A. and M., with the heading, *Vegetation clears Pond Water.* Ponds receiving organic matter have clear water, says Professor Irwin. Manure has the same effect. Our reader suggests therefore that green matter and manure be combined and that compost be applied to make muddy ponds clear.

—o—

GEORGE CLARK, the cartoonist, whose *The Neighbors,* appears in hundreds of papers, recently had a good one of a Peace and Victory Gardener with a spray gun over the caption: "I wonder if this bug spray is habit-forming? They seem to sit up and ask for more." Sometimes, it does look like that.

—o—

THE JOURNAL of the New York Botanical Garden had an interesting discussion by John H. Myers, called *A Commuter's Greenhouse.* This should be useful to those who would like to attach a small greenhouse to their home. On a recent visit to Brewster, N. Y., I saw another most satisfactory solution. One room in a friend's house has a glass ceiling. Thus we had our breakfast between geraniums and oleanders of tree size. They all got enough light from above and made an excellent growth. Behind one of the tubs with a giant geranium, one of the much-loved family cats had her nursery established. The warmth came from the heating system below. If I ever build again from scratch, I shall adopt this idea and put a greenhouse or glass-covered patio right in the middle of the house.

—o—

LAST YEAR, I reported the start of an experiment with alfalfa. The general rule is that alfalfa responds very quickly to changes of day length and that one can grow a more Southern alfalfa farther North, but not a Northern alfalfa farther South. I found this entirely true and could have saved myself a good deal of money if I had not ordered some alfalfa from Chicago.

—o—

Standardized Plant Names, 2nd edition 1942, J. Horace McFarland Company, is a very useful book for professional and amateur gardeners. Not only will you find in it all the common, accepted, scientific names of a plant and their standard pronunciation, but also many separate lists, including one of plant patents. As pointed out in my recent strawberry article, confusion about names may sometimes even produce serious factual confusion among scientists. For unless we know what we are talking

about, we cannot be sure that we mean the same thing. Bridge players have standard bidding conventions and "Calling a spade a spade" is another old expression; but calling plants by their right names is rather involved, and correctness in the trade is now largely due to this book and the men behind it. Since we are talking about our contributor, Dr. McFarland, I should perhaps add that he is just bringing out a wonderfully made book on *Camellias,* perhaps the most carefully printed book of this sort ever undertaken by a private firm in this country.

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TIME AND AGAIN, readers write in and ask questions on various kinds Compost Fails To Heat, Compost for . . . .?" Many of these questions have been answered in our booklets, *Questions and Answers on Compost* and the new edition of *Compost and How To Make It.* This new edition—mentioned in an ad—is much improved over the older booklet. It contains a great deal of practical information that J. I. Rodale has gleaned from the writings of other composters. Also the experience of many years of practical work at the Organic Gardening Center of the Rodale farm is utilized. If Compost Fails To Heat, Compost for acid-loving plants, Compost and Lawns, Organic Materials, Winter Composting—these are just a few of the hundreds of problems discussed and answered. It is impossible to answer questions as fully as we wished we could when readers write in, because *so many* write for advice; but it is possible for the readers to find the necessary information in these pages now and to do a little sound experimenting of their own.

—o—

IN LATE MAY, when weeding my vegetable garden, I noticed four or five tomato seedlings volunteering in my celeriac bed. They had survived the winter temperature on top of the soil, since that part of the garden was only spaded in spring, and I am now curious as to whether it would not be possible to breed a hardy tomato by selecting seedlings that managed to pass the winter frosts undamaged in seed stage. Very little is known about this matter and I hope to find out something about these persistent tomatoes and their descendants. If I do, I shall report about them next year.

—o—

AMATEURS have usually made the great discoveries in science, the early and basic experiments on which the specialists later elaborated. No field offers so many good chances for experimenting as do biology and horticulture. Instead of following the counsel of the expert, see what happens if you deviate from the standard practices! Last Christmas, I planted three different species of lilies in the open. They all came up soundly this May. This doesn't mean much, but it means that we need not worry if we cannot get delivery of bulbs in August or September. Gardening is an art, not a science; to become proficient you have to practice the art.

—o—

ONCE I WROTE a novel and relished my critics. When the publisher sent me those clippings, there was usually one which said that the character of Dita or Conrad or someone else was a splendid life-like study, drawn from a varied and wide experience. But there was always another one that made me keep my head: Dita, Conrad or someone else in the book was "completely impossible". Of that I am now reminded when the readers write. "You are giving your average reader more than he can read and digest. I would prefer a smaller magazine," says one correspondent, and, the same day, another one writes: "I am just crazy about your little magazine and hope it can be increased in size and contents soon." I guess we have to steer the middle course and keep the magazine at its present size for a while.

Superphosphate and Rock Phosphate

SOME MAY THINK. it rather cranky for us to harp constantly on the rock phosphate question. Let us look at the new Illinois *report issued by Professor DeTurk* of the University and Experiment Station. In 1945, Illinois used 381,751 tons of rock and colloidal phosphate and a mere 31,456 tons of superphosphates.

This makes us wonder why in some other states superphosphate almost holds a monopolistic position. There is a shortage of rock phosphate, the inquirer learns. But apparently, superphosphate in commercial mixtures is available quite easily. It would seem that where finished products can be made, raw materials could also be supplied. At least, we see that the Illinois Station has done a good job and saved the citizens of Illinois hundreds of thousands of dollars every year.

Superphosphate—the name sounds so wonderfully rich, as if you were getting something superior. But are you? Well, you get, as we said before, a certain amount of sulphur with it, whether you want it or not. This sulphur is combined with calcium, which makes it quite insoluble. Besides, as *Professor Merkle of the Pennsylvania State College* writes us: "The sulphur requirements of plants are, in general, maintained by the sulphur brought to the earth in rain-fall, and this seems to be sufficient." It is definitely sufficient in the coal-burning regions of the North-East, the very regions which find it so difficult to get adequate rock phosphate and the very regions which rely so widely on the more expensive and less satisfactory superphosphate.

Rock phosphate, as we showed in previous issues, has outyielded other materials including superphosphate on quite a variation of soils. It is therefore surprising to learn that Vermont, until now, has not permitted importation of rock phosphate for reselling, though an individual could order for his own need a car-load of the material from outside sources. The new Commissioner of Agriculture seems to have the fairness of mind and the judgment to realize that rock phosphate and also bone meal were never meant to be excluded by law. But it is the task of the public to go to the legislature and to do away with laws that interfere with the free flow of trade in less costly fertilizer materials of proven benefit. There must not be any interpretation or discretion in matters that concern the future of our soils and our health. There must not be any group that can benefit by the exclusion of less costly phosphate rock and the sale of superphosphate, if the farmers and gardeners of a state can gain not only savings for themselves, but sustained fertility for future years.

The first Antibiotic was discovered in the 18th century when Goethe found that mushroom extract killed microbes that he was keeping for biological experiments. The notes were published from the original manuscripts some forty years ago.

Oriental Poppy, Deutzia and Iris

McFarland

Old Fashioned Flowers

By DORIS CLARK

THE POPPIES

When you look up the index of a flower catalogue, you will find a great variety of annuals and perennials listed as poppies. To name the most important, we have Plume Poppy or Tree Celandine (*Bocconia cordata*), California Poppy (*Eschscholtzia*), Santa Barbara Poppy or Tulip Poppy (*Hunnemannia*), also called Mexican Tulip Poppy, Annual Poppies (*Papaver*) usually divided into single and double Shirley Poppies, and finally the perennial poppies, divided into oriental (*Papaver oriental*) and Iceland (*Papaver nudicaule*). There also are usually the Prickly Poppies (*Argemone*) available. These are the more common members of the poppy family that are found in our gardens. They differ enormously as to leaf shape, flower shape, growth habit, and flower colors.

If we ask the geneticist, how they are related, he will tell us that the genera *Papaver, Hunemannia, Argemone, Eschscholtzia,* and *Chelidonium* do not cross. The Celandine or Chedlidonium is among the hardiest of weeds, known to everyone in the Northern part of the country as a sturdy perennial, whose beautiful orange-colored milk sap, oozing gently from deep yellow roots and juicy stems, whose delightful early flowers, and whose interesting seed pods are an attraction on every trash pile. The Chelidonium is not often planted deliberately, but it is worth having just the same, even in its wild form. For its beautiful leaves alone are a delight.

The geneticist determines plant relationships under the microscope. He makes a small cutting, stains it, and observes these stained parts; he calls some of these chromosomes, which means dye-bodies. They are the carriers of hereditary characters. If he finds two plants of the same chromosome number, he is likely to predict that these plants can be bred together. This, of course, is not a fast rule, since many plants do not cross, though they have the same structure and are otherwise closely related. Just to see *how* the poppy family stands on chromosomes, we make a list of the main genera or groups:

	chromosomes
Chelidonium (Celandine)	12 or 16
Eschscholtzia (California)	12
Papaver (poppy proper)	12
alpinum	14
rhoeas (Field poppy)	14
nudicaule (Iceland)	14 or 28
orientale (Oriental)	42
somniferum (Opium)	22 or 44
Argemone (Prickly)	28 or 56
Hunemannia (Tulip)	56

If we look for the original home of these plants, we find Argemone and Hunemannia native to Mexico and the Southwest, Eschscholtzia native to California, all the others originating in Asia and Europe, from Persia and the Balkans, where the Opium Poppy first appeared, to the Arctic regions, where the Iceland Poppy flowers. But hardly any of them can be crossed, even if the chromosome number in a few instances should be the same.

The gardener will distinguish between Shirley poppies and perennials, because he will have to determine whether he wants a bed permanently in poppies or whether merely to sprinkle some annuals amidst his border. He will also have to consider the height: Should he grow the smaller Iceland poppies or the tall oriental perennials? And he will finally consider the colors: The Iceland poppies are orange, red, white, and yellow; the oriental poppies vary largely in shades of red and are the only kind that is being propagated by root division and by cuttings, which preserves their identity and makes it possible

for florists to sell them in pots. One of the varieties, Perry's White has actually white petals with a brownish blush at the base of the flower. The corn poppies, Flanders Poppies, etc. (*Papaver rhoeas*) have various shades of red, sometimes with white margins, usually with dark blackish or blueish spots on each petal. A final problem to consider is time of blooming: The Iceland poppies bloom often in spring, the Oriental poppies early in summer.

The opium poppy—an annual, too —differs from the others mainly in the waxy hue that covers stems and leaves, while the majority of the other poppies are hairy. Doubles are frequent among the Oriental and Opium poppies as well as the Shirleys; scent is found among the Iceland poppies; cut flower qualities are only found among the Oriental group. The common Opium and field poppies will drop their petals as soon as they are cut.

And now to the requirements: All poppies are heavy feeders, though the perennials and biennials (as the Caucasian Poppy) can be grown consistently in the same spot if they are given an occasional topdressing of compost after the leaves have died down. Annual Poppies are apt to grow very densely since the seeds are so fine that you can never quite anticipate that all will come up; but all do come up and you have a dense stand. This is very attractive, too, and forces the plants into quick flowering rather than extended growth, but naturally exhausts the soil. You cannot very well grow them year after year in the same bed. You certainly should not do it with the tall opium poppies, whose seed is rarely offered, because there is said to be fear that opium could be extracted from them. In Europe, the Opium Poppy is grown commercially, not for its milky sap, which the aphids and their friends, the ants, also like, but for the seeds, which are sprinkled on various bakeries, especially the wellknown Berches rolls. The seeds contain no opium whatsoever. There are several varieties, classified manily according to seed pod formation. Some shed their seeds, others have pods which hold the seed firmly. The purplish colored ones tend to have closed seed pods, the reddish ones are more self-shedders.

Poppies look best in drifts, large masses of one or two colors, seaming a walk or running through a border. Poppies, especially the Shirleys, are helpful in bulb beds because you can sow them between daffodils, tulips and hyacinths to come up when the bulbs are finished. Owing to their preponderance of reddish shades, they can be mixed with blueish-hued flowers of similar height, especially the larkspurs and bachelor's buttons. The latter two can also be sown between the perennial Oriental poppies. The Eschscholtzias and Argemones, on the other hand, look best in beds of their own. Here, too, breeding has produced new shades and forms, including doubles and semi-doubles.

When you sow Shirleys in spring, they bloom the same year; so do the Iceland poppies. The Oriental poppies have a strange habit: They lose their leaves in summer, but new leaves arrive again in fall. During winter they

Shirley Poppy McFarland

more or less disappear, but early in spring they come again and make their real growth. While annual poppies, including opium poppies, are hard to transplant, except in the smallest stage when you can take a cluster of them on a trowel and set them in a moist spot to make immediate connection with the ground, keeping the transplant shaded and moist, the perennials can be transplanted when the fall leaves are coming. As a rule, annual poppies are not to be transplanted at all and, if the winters are not too hard, had best be sown in fall, though spring sowing is also quite satisfactory.

The tall fringed poppies, carnation poppies, with the greyish-hued stems are opium poppies while the Shirleys are descendants of the field poppies. Under natural conditions, in their original home, from the Asia Minor region across to the Balkans and the European continent, these plants shed their seeds in summer and the seeds stay dormant below ground until the following spring. But they do not germinate before that. So often, the books advise to sow some plants in fall. This is good enough if you sow them in a cold frame. For if you have tiny pansy or delphinium seedlings and then a severe winter, you will not save those late seedlings in the open. No such fear need be harbored as regards poppies.

I sowed one time half of one packet in fall, the other half early in March the next year. Shirley poppies they were. And they bloomed at the same time. There was not a day's difference in their blossoming. On the other hand, I have sown tall opium-type poppies in spring. The ones sown a week earlier bloomed a week earlier than those sown later. In this respect then, you could have a good succession of some poppy blooms if you sowed them gradually.

Poppies are becoming more and more popular and the named varieties are increasing in number. As far as I know, there is no Poppy Society as yet, and I wonder why. Poppies are delightful and highly varied and variable, always a pleasure for the experimental gardener, *but*—they have one fault: they are no cut flowers. Their beauty is passing. But fleeting beauty is still beauty and I should not do without it.

Iceland Poppy McFarland

Oriental Poppy McFarland

Success On The Small Farm

A Book Review

HAYDN S. Pearson wrote the book and McGraw-Hill put it out for $2.50. It is a practical book with few loose ends if you want to make $2000.- a year on a medium-sized farm of 12 to 15 acres by means of direct sales to customers. Pearson has planned several diversified enterprises, especially asparagus and berry growing, on the assumption that you sell your produce retail at a roadside stand. The costs for picking berries, the problem of getting help at the time needed, and the costs of setting up roadside stands and operating them successfully are not worked out, but even so the book is worth reading and full of practical suggestions. Pearson knows people and will save many a would-be farmer serious financial loss and disappointment if he pays attention to some of the major suggestions, of which the irrigation question is properly emphasized. There is also due emphasis on compost, organics, dropping pits, sensible animal care without forcing the limit, and crop practices. *Success on the Small Farm* applies largely to the Northeast, where roadside stands are less common than in other parts of the country. Friends of Faulkner's theory will find valuable arguments *in favor* of plowing, arm-chair farmers will learn a lot on weed control and berry culture, and practical growers will benefit by the book-keeping suggestions, which agree with the present Federal tax law, and by the sound advice on experimenting to improve crops and profits. The fundamental thesis is sound: a farmer cannot keep on buying at retail prices and selling at wholesale, if he wants to raise his income and has only a small place. The solution of selling in a roadside establishment will, on the other hand, not appeal to many intellectuals who would like to live in the country and make it pay. Still, Haydn did not mean to advocate country life as a "form of living", but as a source of income. Those who seriously want success on a small farm and have about $6000.- to $8000.- to start with are bound to benefit from this book

Meyer

Howard As Prophet

SIR ALBERT HOWARD stated years ago that the method of improving crop varieties also meant that the soils were depleted more quickly. He ought to know, for he is credited by his government to have added $30,000,000 worth of crops annually to India's farms by his improved varieties. We now have the same problem in the United States. The plant breeders have increased the yields of varieties, especially by breeding good hybrid corn, but they have also increased the demand for fertility. An increase of 15 bushels per acre means, according to F. W. Parker of the Bureau of Plant Industry that an additional supply of thirty pounds of nitrogen must be found too. The best cultural method is liming and sowing to alfalfa.

My Eccentric Dad

By DOROTHY MAE WHITE

THE term "Organic Gardening" jarred into my vocabulary less than three years ago. We were on our way to a party when Dad drove up to the student-nurses' dormitory with his red Pontiac fairly bulging with cartons and boxes filled to overflowing with leaf mold gathered from a nearby grove of live oaks. Then, to further shake my still delicate senses, long and short handled shovels, pitchforks, rakes, and hoes protruded from the rear of the car while a shiny new wheelbarrow grimaced at me from where it was balancing precariously on the top.

But this was just a beginning—scarcely a promise of what the future had in store in the line of organic surprises!

First let me make it clear that my dad is definitely an "All or Nothing at All" individual. Overnight, we had miraculously become "farmers", so the world was soon to know us all as such. I even went so far in the way of advertising as to appear at a formal wedding with a sleeping caterpillar on my coat collar. Apparently little "Woolly" had chosen me for greener pastures after she had stowed away in the leaves Dad stopped to gather en route. No matter where we are driving, we just cannot pass up anything that will serve as fertilizer or mulch for our garden.

Yes, there was a time when we could half expect to arrive at our destination at a given time. But those days are gone forever, gone at least as long as there is a piece of earth along the side of the road to cuddle and "analyze."

Last summer we spent a delightful two weeks in Northern California. The rest of the family swam and boated while dear Dad (who is usually wild about sports) spirited from farm to farm sneaking off samples of earth. Dad was continually on the look-out for a tract of land on which he could practice organic gardening to his heart's content. As usual, we vacationed until the last minute and were hurrying home when disaster struck. Dad had left several cans of his precious sample-soil behind. Almost tearfully he bewailed the institution of gas rationing and his "tread-bare" tires. The clouds were not lifted until one of us suggested that all could be remedied by Railway Express. Our host, having caught Dad's contagious enthusiasm for organically rich soils, thoughtfully and carefully packaged the dirt, insured it, and sent it on to Gardena.

But why give so much space to dirt when rocks are just as enthusiastically collected by Dad. I could somehow maneuver around the dirt and leaves in the back of the car, but those rocks had me stymied. Every precious "souvenir" that Dad now has packed around his fruit trees and grape vines as a rock mulch has at one time either scuffed my shoes, snagged my hose, or taken a crack at my head.

There was a day when just the thought of a worm paralyzed me. However, since I have been convinced that our civilization fairly hangs on the little darlings, I've tried to become more broad-minded. A fortunate change of heart, since our garage and lath house are literally crawling with

Dorothy Mae in the yard

H. C. White Photo

cultures. I don't know what "culture" means to you, but to me, at present, it means the handfuls of soft, dark, velvety topsoil Dad scoops up and coos over while fifty or more objects of slippery animation squirm through his fingers.

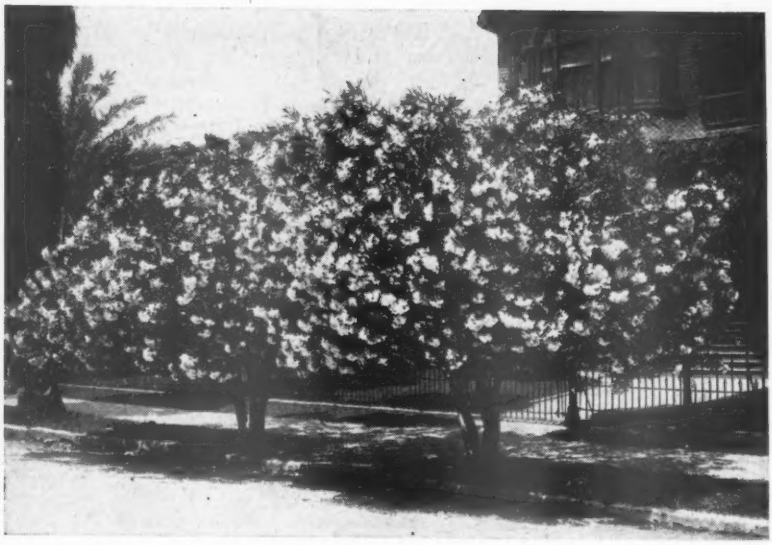
My friends, too have had to experience a readjustment process with me. The survivors can be identified by the ease with which they can discuss compost, neutral colloidal humus, or all the latest angles of the worm. Thanks to organic gardening I have also won strange new friends. There's Mr. Blake of the Fire Department and Mr. Tomkins, chairman of the Public Sanitary Committee. (I expect to bump up against the police any day now.) Their common burden is that huge mound Dad has piled against his back fence. Dad calls it his compost heap. I have a more appropriate term for it. I agree with my official friends that this compost heap might possibly constitute a fire hazard and a public menace and have promised them faithfully that I will take my eccentric dad in hand. Yet, even as I speak, Dad is behind the fence with his car and trailer, pitchfork in hand, adding a couple of tons to his "toy."

But don't get the idea that I'm complaining. I have the most perfect Dad in the world. Incidentally, he lives in about the prettiest garden you have ever seen.

Silage and Compost

THE FERMENTATION which takes place in a silo is brought about by bacteria, and yeasts similar to those or identical with those that break up green matter and manure in the compost heap. Bacteria forming lactic acid are the most desirable, bacteria forming acetic acid produce material smelling of vinegar, bacteria forming butyric acid produce a rancid smelling substance. A recent report by Archibald of the Massachusetts Experiment Station was printed in the *Journal of Agricultural Research,* April 15, 1946. We lift out two interesting facts: Silage made from wilted alfalfa was quite different in composition from that made from the unwilted crop. The wilted alfalfa was in all respects preferable. We found this especially important since we have constantly advised the use of wilted green matter. Another important fact was that small amounts cannot be successfully handled, since losses occur from rotting and mold. The same is true in composting, another reason why we advocate the building of standard heaps in one operation.

Oleanders and Tropical Palms — Galveston News Bureau



Two of thirty-five Oleander varieties in Galveston — Verkin

Oleanders In Texas

By MARGUERITE PALMER
Garden Editor, The Houston Press

Queen of Galveston Oleander Festival

NO matter where you roam along the highways and by-ways of Texas, oleanders grow. Especially in the coastal areas, the oleanders are prolific with bloom, showing vivid and varied hues which form a rainbow of beauty from April until November. They present floral pictures in the humblest farm yard as well as in the large estates, flaunting their democracy.

Over a hundred years ago, the oleanders were introduced into Galveston, Texas, by Joseph Osterman who, sailing the seas in a trading schooner, brought the pink and white varieties in tubs from Jamaica. His sister removed them from the tubs and planted the shrubs in her front gardens near the street. When the shrubs bloomed, all the neighbors besieged her for cuttings, for those were the days when gardening was done over the garden gate and fence, and all gardening materials were obtained by swapping cuttings and seeds.

Fortunately for Galveston and all of Texas, the cuttings of this tropical shrub, afterwards discovered to belong to the Nerium family, grew and as the shrubs were a rarity, they were placed with great pride near the streets. In a few years after the introduction, many of the streets were lined with the shrubs which proved themselves hardy and adaptable to the soil and climate of Galveston.

In the Old World, the flower is known as St. Joseph's flower due to a legend originated in Spain. A mother, worn and exhausted from nursing a beautiful daughter, knelt in supplication to St. Joseph for recovery or relief for the sick child. A rosy light filled the room and a strange old man appeared at the bedside in answer to the prayers. Pink flowers were placed on the breast of the girl, bringing a restful sleep. Before the mother could thank the stranger, he disappeared, leaving the flowers as an evidence of the Miracle. In direct contrast, the modern murder mystery stories often bring into play the milky sap of the oleanders as a poison in their plots.

Authorities say that the oleander is the willow of the scriptures; also that during the Penisular War, the soldiers cut skewers for their meat from the oleander and died from oleander poisoning. In Greece and in Italy, the shrub is called the funeral plant and was known to kill cattle. The Hindu, calling the shrub "the horse killer", uses it for the adornment of the temples and also for making wreaths for the brows of the dead. The milky substance which flows from the cut stems, leaves and flowers conveys the

poison, but the Texan has learned how to be cautious when stripping the narrow green leathery leaves and when harvesting the blooms. In making flower arrangements, it is desirable to remove the leaves, as they are heavy and numerous, detracting from the beauty of the showy flowers borne in terminal clusters.

All colors of the spectrum prevail with the exception of blues and purples, thus ranging from pure white through the yellows, pinks and salmons to the deepest red shown in the thirty four or five varieties grown in Galveston. Colors and shades can be chosen for a color scheme to harmonize in garden areas or for floral adornment of the home. The values of color are so distinct that almost a chromatic scale can be used, developing the half tones and whole tones.

Many varieties bear the names of the old Galveston families. One variety presenting the rich, dark red colorings was named in honor of President Roosevelt, who disembarked at Galveston in the spring of 1937 after completion of a fishing trip in the gulf along the Texas coast.

In addition to color variations, there are variations in form as the clustered flowers are comprised of single petals, double petals and triple petals. The flowerets, about two inches in diameter, are borne in clusters at the termination of thick branches. Flowering is so prolific that a mass of color is produced. Although the branching canes are numerous from the roots of the shrub, the plant can be made into tree form or into a standard by pruning and training.

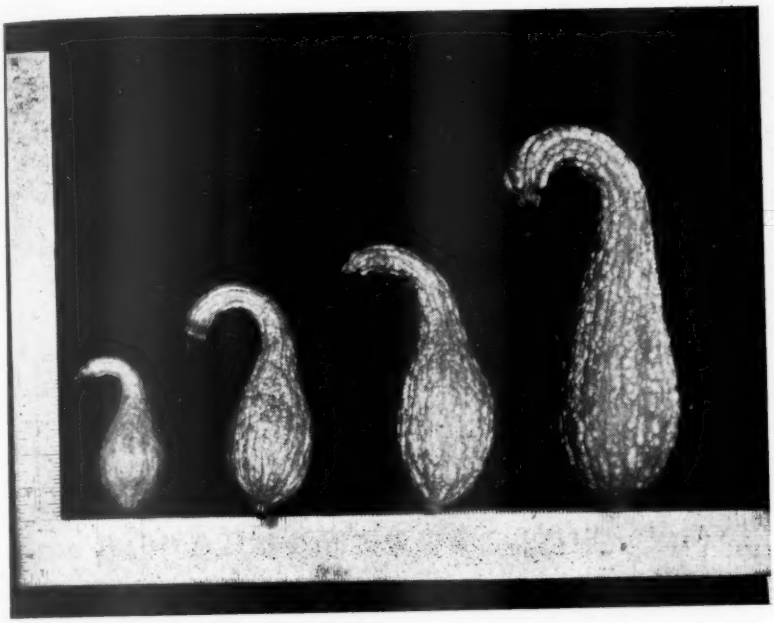
There is an old superstitution in Galveston that when the flowers are most profuse, a tropical storm can be expected. However, the Texan gardener disregards this omen, for it is realised that the heavens had been kind and rainfall sufficient during the actual growth of the plant preceding the formation of flower buds.

The shrubs are easily propagated by cuttings from the old wood with cuttings placed in flats of sand. The mature wood cuttings can be rooted in jars of water. However the cuttings should not be allowed to dry out when located in the garden. The soil should be full of humus and friable to receive the fine rootlets which reach out in growth. A quick method of getting large plants is a root division from the mother plant by using a sharp spade to cut the root. The mother plant profits by the operation, if humus and cultivation are given to overcome the shock. Truly, the propagation is so simple and easily done that almost every gardener, should she be asked the source of her shrub, would probably answer, "From my next door neighbor."

Sunlight and air and good loamy soil and water comprise cultural instructions—perhaps there is a fondness for the soft breezes of the gulf, the salty spray, the moisture in the air, and the tropical sun. In the North, oleanders are planted in tubs and have to be nursed carefully. Here in the South, they are planted in the garden area, growing six or seven feet high.

If the tops are frozen during a severe Norther, the plants should be cut close to the ground and banked with good loamy soil. After all danger of cold weather has passed, good treatment will make the oleander, "grown-up again," more vigorous and more intent on blossoming, especially if well rotted manure is added to the loam or perhaps a good dosage of bone meal. For mealy bugs, soft scale and white oleander scale, a spray should be used to combine nicotine, or pyrethrum and soap.

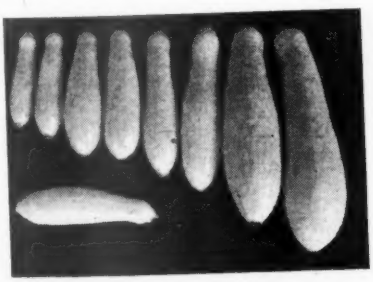
All varieties are fragrant. In the olden days, soldiers were forbidden to sleep near plantings of oleanders for fear the fragrance would be overpowering. Under the Southern skies near the moon-lit waters, hedges of white oleanders with their fragrance create an atmosphere of irresistible charm and appeal, overpowering in their beauty. Homage is given to these flowers of the oleanders as they create a symphony of color in Texas for seven months of every year.



Crookneck Summer Squash — Ferry-Morse Seed Co.

The Squash

The Squash is not very different from the Pumpkin. Squashes divide into two main groups, summer and winter varieties; the latter are commonly used for canning and making pumpkin pies. The former, among which the zucchini squash is perhaps the most delicious as a vegetable, are rarely cooked in the sweet way of pumpkins. Recently, Dr. Curtis of the Connecticut Experiment Station made known that as a member of the American Food Mission to North Africa he discovered some squashes of the *moschata* species which had firmer flesh and a smaller seed cavity than ours. Imagine the effect such an introduction will have on farm practices. Since the flesh in the African squash is about twice as thick as in ours, a farmer could grow the same amount of "pumpkin" on half the acreage.



Prolific Straightneck Squash — McFarland

Winter Squash Delicious — Ferry-Morse

Talisman

McFarland

A Great Scotch-American Gardener

By J. HORACE McFARLAND

JUST when I became acquainted with John McLaren I do not know, for it seems I had always known him and of his great work. Like George A. Parker of Hartford, he was a park man who stood out above others because he was able not only to do things on and in and with the land, but he could make politicians sit up and take notice.

My last vigorous contact with him was when I was in California in 1931, and had gone to Golden Gate Park as a matter of course. I saw then what he did and how he did it, and almost why he did it.

But one thing happened to me that I shan't forget. I was going about California to help all parks, whether they were to be national parks or local parks, and in the course of my disturbance I went to San Jose, where Mrs. Charles C. Derby lived. She had kept me from ever going to sleep about any good thing that California wanted and ought to have. At this time she was determined that San Jose was going to have a municipal rose garden, and in her masterful way she caused the city authorities to set aside an area of land suitable for this garden. The fact that it was solidly planted with shrubs and trees did not interfere in the least with her determination to have that rose garden. In due course I came there, and was taken to the site of the garden—a very pleasing site, by the way—with the statement that the garden would now be dedicated, to bring to pass which auspicious event there was a great gathering of citizens, and, what to me was much more concerning at the time, the schools of San Jose.

I was handed a nickel-plated spade, decorated with an immense bow of bright red ribbon, and told that I was to break ground with it.

Now I was totally unfamiliar with California's "dobe" soil, and thus when I applied this spade to the ground amid great interest on the part of all the children, who were everywhere, and with great perturbation on my part, nothing happened. I couldn't stick the spade into the soil.

Then came a real man of the soil, John McLaren. He took the spade from my hands, and either because he had the magic touch or knew the soil, he was able to thrust it into the ground and turn a shovelful so that it might be said the garden was open. It had all yet to be cleared of other growth, but that made no difference to this extraordinarily energetic woman any more than it made to the even more extraordinary park man who was there to see a rose garden started.

I was on my way east the next day, and I have not had an opportunity since to discover more than the fact that San Jose has a creditable rose garden. When I think of that scarlet-bedecked spade and of the vigor of the Scotchman who supplanted me and made it dig, I am naturally interested in what really did happen.

Now this was not at all an unusual or difficult thing for John McLaren. He was a dozen or more years my senior, but nothing had staled his vigor, his strength, or his determination, and the fact that the boys and girls of the schools were climbing quite unrestrained all over us made no difference whatever to him. The city council which was to have dignified

the occasion was there, but neither did that make any difference to Mr. McLaren. He got the ground broken. My only breakage was the fracture of my self-complacency, for I have never since had sufficient opportunity to do things with nickel-plated spades decorated with scarlet ribbons! Such an experience would be quite in line with Mr. McLaren, I believe, and he would go through with it wherever it occurred, as he did when one eastern rose man was in the neighborhood.

Later on I saw things about Golden Gate Park which easily convinced me that such things were not done in San Francisco as they would be done in an eastern city. John McLaren had his own way and he knew how to carry it on. As a result of his prodigious efforts he made parks to serve human needs as no one else dared to do.

Vitamins and Animals

The Agricultural Experiment Station at Pullman, Washington has just issued a bulletin by Ensminger, Heinemann, Cunha, and McCulloch on the relation of Thiamine to Hog Feeding. Much of our human vitamin intake comes from meat, but quite apart from the effect that animal feeding has on the consumer, we must consider the effect on the animal. It was shown that pigs fed on ratios deficient in thiamine made less gain per feed than those which had a balanced ration. In the last analysis, this indicates nothing less than this: We should not eat white bread at all. It is also interesting to note that a deficiency in thiamine led to enlarged hearts in pigs, an interesting confirmation of our position that poorly balanced diets and denatured food produce our common diseases.

The Nitrogen Problem

F. W. PARKER, President of the *American Society of Agronomy* and Assistant Chief of the Bureau of Plant Industry, recently read an address on the Nitrogen problem, which was published in the April, 1946 number of the *Journal* of the American Society of Agronomy. In it he says: "Our most important supply of nitrogen is that contained in soil organic matter." In selling crops and livestock and livestock products, some of this nitrogen is taken from the land. "The net loss must be measured in millions of tons. In addition there are the great losses from leaching and erosion. Losses of organic matter through erosion mean almost directly proportional losses of nitrogen." How important our organic gardening is appears from Parker's statement: "The maintenance of existing supplies of nitrogen is promoted by several sound practices, including the conservation of crop residues and farm manures, use of cover crops, and the control of erosion."

The Potassium Value of Compost Humus

By ROGER W. SMITH

ORGANIC gardeners aren't much given to bothering about soil chemistry. They prefer to think of the soil as a living thing, as an inert structure filled with a mass of living microorganisms. As a rule, they feel that no very accurate picture of a soil could be presented by a statement of its chemical content anymore than a coral reef could give a picture of the nature of the millions of tiny creatures from whose cells that reef was built. But there are occasions when the value of organic methods is shown by those who work with chemicals.

Soil chemists have estimated that the potassium content of the average soil to plow depth to be around thirty-five thousand pounds per acre; that an average crop of four tons per acre, dry weight, contains not more than one hundred and sixty pounds of potassium.

Thus it would seem that the average soil should be more than able to supply potassium needs for many years especially since there is much more potassium available below plow depth.

Unfortunately, all potassium in the soil is not available to plant roots. The roots can use only that part of the potassium which they can reach and which is loosely connected with the soil particles, not more than one percent.

With porous, sandy soils, root penetration is somewhat easier. This advantage is offset by the fact that such soils are low in potassium, much lower than loam or clay soils because of their inability to store it.

Upon the physical structure, then, depends the availability of its potassium content. If a "tight" heavy soil can be loosened up, its value to plants is quickly apparent. From time to time various inert substances have been recommended to improve the "crumb" structure of the soil, to loosen soil particles. Their value has been brilliantly shown, usually by selecting soil conditions where they would be most effective.

Peat moss has been used in the past to improve many types of soil. Stone dust, and many other substances. Most recent is the much publicized "vermiculite," an artificial fluffy, powdered form of mica which was formerly largely used to insulate buildings. Its use was the natural outcome of the use of glass-wool, another lifeless substance which had for some time been used as a soil conditioner.

These inert substances in themselves are as harmless as the stones you find in your garden and serve about the same purpose. They increase the porosity of the soil but bring with them no plant food.

So let's look into the matter of plant food, especially potassium, since the chemists like to classify such things.

Plants will absorb much more potassium, the chemists tell us, than they readily need if it is available. They store it up in their tissues. Thus we have a picture of potassium-hungry plants, barely able to secure what they need from a soil relatively rich. It is at this point that the value of tillage becomes apparent, soil loosening.

Digging and raking the garden, properly managed, changes a tight-packed soil into a mellow crumbly one. Soil particles become more widely separated. The garden surface is visibly raised. Air-filled interstices are formed. The garden becomes soft to tread upon, pleasant to handle.

Tillage makes the potassium content of a soil more easily available to the roots of plants. The digging-in of inert substances in a heavy soil may often improve matters—in fact, the digging in of these substances in light sandy soils may also be effective because of their water-holding capacity.

Getting back to tillage, this makes the potassium content of the soil more easily available to the plants. But since plants are hungry for this substance it is apparent that stirring the soil, making available its reserves without doing something to replace their loss, can quickly result in a worn-out, infertile soil.

Under conditions as they exist in the wild, excess potassium contained in herbage was returned eventually to the land from which it came. Cropping results in a steady removal. How can this necessary potassium be returned to the soil?

One cow, or seven hundred hens, produce annually in their manure and urine about one hundred and fifty pounds of potassium, about enough to replace the potassium removed by a four ton per acre dry weight crop. But the return of this does not quite replace the loss. With each crop the soil has lost some of its organic bulk, its water-holding ability, its easily available supply of potassium. The soil particles, under such conditions, tend to become more and more tightly packed as the years pass, and soil potassium less available to roots.

The use of green manures is a partial cure. But for best results green manures should be plowed under while young and tender. Mature plants fail to breakdown rapidly enough, their use often hinders the growth of following crops.

It is at this point that the gardener is tempted to use, and often quite effectively, various inert and harmless substances to loosen up his soil. He knows that by their use he can make available much potassium tied up because the soil particles are too tightly packed.

The best of all soil conditioners is mellow compost humus. Only by composting is it possible to return the heavy, stored supplies of potassium of mature plant growth to the soil in its most easily available form, with its naturally broken-down animal manures. In the compost heap natural decomposition is encouraged, even speeded up.

The return to the soil of properly made compost humus not only serves the same purpose as the addition of neutral soil conditioners, peat moss and vermiculite, it does something more; it conditions the soils and adds the necessary plant foods, it takes care of potassium loss caused by plant growth.

The potassium value, in fact the whole value of this substance as a soil amender, may be readily tested by growing a few tomato plants. These plants should be grown in very poor soil, soil probably lacking in potassium.

The young plants will be slow-growing, their small leaves crinkled; the larger leaves greyish with whitish spots. A few plants should be kept separate, allowed to grow under original conditions as a check upon the others.

The other plants should be given liberal applications of compost water and heavy mulches of ripe compost. Very quickly the compost plants gain in size, their leaves become normally green. Their stems become normal in length and thickness. They look healthy and bear fine healthy fruit.

The check plants show more and more markedly signs of potassium deficiency. They are dwarfish. Their leaves are mottled, crinkled and small. Their stems are thin and woody. The small amount of fruit they manage to set is small and malformed.

The thoughtful organic gardener will note these things. No elaborate equipment is needed. It is unlikely that the chemical gardener himself could give a more convincing demonstration of the value of compost humus.

A sail scow built by Capt. Haden to collect sea weed on the beaches of Biscayne Bay fifty years ago.

Forest Gardening

By JOHN C. GIFFORD

Professor of Tropical Forestry and Conservation, University of Miami, Florida

A word they say is merely the symbol of a thought and the thought behind the word "garden" it seems to me is a piece of land devoted to certain plants to the exclusion of all others. It is certainly not confined to pervaceous plants and can be rightly applied also to shrubs, vines and trees. A forest is an association of living things the most important of which is the tree. These things are living together, some conjunctive, some disjunctive, some antagonistic and some reciprocal. The forester studies these combinations in lands under his control and favors the kinds which fit his purposes and disposes of the things which are in his way. This certainly is a form of gardening. Every forest is a multi purpose forest and although it may have one main purpose it cannot help serving other purposes on the side.

The forester cannot afford to fertilize his land in fact does not need to if an abundance of good humus is produced. Humus or leafmold therefore is both the product and producer of the forest. By growing trees in forest

formation he does not plow, hoe or cultivate. He guides their growth with axe, saw and machete. A tree is simply a plant that holds its working foliage aloft away from the ground on sticks. The care of this forest after all is nothing but a kind of gardening and is so named in many parts of the world. We call it "selective cutting", the French call it "jardinage" and the Germans refer to it as "pemelbetriet". Jardinage is just the French for gardening and "femel" probably refers to the plucking out of the male hemp plants and the undeveloped females after the flowers have been fertilized. In England the term "fimble-hemp" was applied to male hemp plants. These words were applied to forestry in the beginning and up to the present time is still the best system for mixed uneven aged stands of trees, in fact, insofar as I can see the best method of treatment for the common run of forests throughout the world. The forester should never cut a tree unless he has a reason other than the mere reaping of a crop. It seems to me this is just another form of gardening. Once a forest is started no matter its purpose you can proceed without constant plowing, fertilizing or hoeing such as is bestowed on field crops. The amount wasted on fertilizers and labor through the years is beyond calculation. The real definition of idleness is not doing nothing only it also applies to useless work. When the engine of your car is allowed to run while your car is stopped is rightly called "idling". In the forest garden man guides the natural forces in harmonious production with trees in forest formation.

Unlike a common garden or field the forest fertilizes itself. This is the natural way and the closer we follow it the likelier we are to continuously succeed.

Just how to distinguish between a grove, an orchard or a forest is difficult. A garden of willows is called an "osier-holt", a forest of sugar maples is called "a sugar-bush". In Australia and South Africa the wildwoods are called "the bush", apple, pear and peach plantations are called "orchards", orange and lime plantations are "groves" and over in the Bahamas a pine forest is called a "pine-yard". In the Tropics a dense growth is "jungle" and in Florida a dense growth of hardwoods is called a "hammock", a cocopalm plantation is called a "cocal" and a coffee plantation a "cafetal" and so on. Wherever trees are growing regardless of the kind or name, producing the necessary humus for their own growth with the proper cleaning, thinning and harvesting with future betterment in view it is truly "gardening".

What you in your magazine have for so long advocated I have tried to apply to the Tropics where agriculture, horticulture and silviculture mingle. By dibbling in seed, by sticking in cuttings and by layering branches you can often accomplish a lot in even a hopeless looking tangle. By maintaining such a forest the land has a protective canopy so that organisms can freely operate in the carpet on the forest floor. It has been well said that the world is still governed by Father Time and Mother Nature and regardless of what man does no natural law can ever be changed.

In spite of what is said to the contrary we did well with Victory Gardens. Why not convert them into a permanent institution and plant them to trees instead of herbaceous crops? Such a garden would be a glorified victory garden.

I devote my time to fifteen favorite time-tried trustworthy trees. They are cocopalm, mahogany, mango, avocado, lime, guava, cajeput, Australian-pine, lebbek, poinciana, coffee, chocolate, ceiba, sapodilla and bread-nut. I have been especially interested in five wonders of the vegetable world: the peanut, pine-apple, banana, cassava and vanilla. If your readers are interested in any of the above I shall be glad to explain why in future writings.

"Organic" Ideas and Methods Are Supported by "Scientific" Literature

By THOMAS S. MICHENER, JR.

IT is inevitable that sooner or later the "scientific" Literature should contain evidence of the fallacies of synthetic fertilization, and of the soundness of Organic principles. The examples of this evidence are naturally buried under a welter of details of scientific experiment reports, but it is possible to find them. Indeed, the best place to find them is in reports on experiments that would probably never have been performed if composting and organic plant food were more universally used.

Some of the work being done in agricultural research demonstrates clearly that the more men endeavor to find out why the three elements: Nitrogen, Phosphorus and Potassium at first stimluate plant growth and then cause all sorts of ailments, ills, and troubles with plants, animals and men, the less is truly known and apparent about the proper interrelation of the whole thirty or more elements that may be chemically isolated from living tissues. The knowledge of these relations may come some day, but it will no doubt be further complicated by simple and compound groupings of elements that are as yet unconceived, let alone investigated. It may be soon or it may be years before scientists discover that plants may need complex foods for healthy growth, and for healthy use of these plants by animals. Can there be any doubt of the fact that these plant foods are readily available in a good manure compost?

Below are some examples of evidence gleaned from the well known periodical "Bibliography of References to the Literature on the Minor Elements and their Relation to Plant and Animal Nutrition" which show that some are doubting the Chemical methods. This collection of summaries was first started by L. G. Willis, Director of the Soil Research Laboratory, North Carolina Agricultural Experiment Station, Wilmington, North Carolina and is now kept up to date and published by the Chilean Nitrate Educational Bureau, Inc. The "Bibliography" has gone through Three Editions and the quotations below are from the sixth supplement to the Third Edition only.

The first excerpt needs no comment: *"Feed Efficiency in Terms of Biological Assays of Soil Treatments"* by G. E. Smith and William A. Albrecht, first published in the Proceedings of the American Soil Science Society, Vol. 7, p. 322-30 (1942) (pub. 1943).

"Biologic assays show that increased yields may not be an accurate measure of agronomic researches when the products are to render their service in sustenance for animals. When the chemical composition of feeds is changed by different soil treatments, the animal response is not correlated closely enough to warrant the acceptance of the chemical analysis as an index of nutritive value. Soil treatments bring about composition changes that are not commonly measured. Lambs fed on hay from land receiving Lime and Phosphates show more gain from each unit of grain consumed as a supplement to the hay than do lambs feeding on hay from either untreated or phosphated soils. They also have a higher oil and yolk content and a significant difference in the Nitrogen, Sulfur and Phosphorus contents of the wool. Furthermore the wool retains its luster in alkali solutions and cards out to a satisfactory fluffiness when scoured with alkali, while the wool from lambs fed with phosphated hay decomposes in alkali solution. Maximum feeding value of forages can be obtained only

when all soil nutrients are present in the proper ratios. The data show that the full value of soil treatment cannot be measured without the use of animal assay."

Another abstract, first published in the Journal of Economic Entomology, vol. 36, p. 640 (1943) *"Relation of Fertilizers to the Development of the Cotton Aphid in* 1941 *and* 1942" *by* R. L. McGarr: "Use of nitrogen fertilizer resulted in a definite increase of Aphis gossypii populations when the cotton plants were dusted with calcium arsenate; when calcium arsenate was not used no appreciable increase occurred. The increase associated with the fertilizer and calcium arsenate was correlated with the percentage of nitrogen in the fertilizer."

Other reports include such statements as "Manure alone, 33 tons per acre produced the best average yield (about 2,000 lbs.) of Tobacco and the highest quality index." or "Twenty tons per acre of manure per year produced almost maximum results—" and "The best tobacco is grown on newly cleared land or where fields have remained uncultivated for several years and accumulated much organic matter from weeds." Statements such as these would hardly warrant writing home or convince a salesman for fertilizer to give up his profitable trade but the point is that such statements do occur. In the New Jersey Station Bulletin No. 709, (1944) entitled, "The Boron Needs of New Jersey Soils" by E. Reeve, A. L. Prince and F. E. Bear, may be found evidence that available Boron is increased by the addition of organic materials and that less plant damage occurs when borax is added if the soil contains sufficient organic matter. A similar study on the magnesium requirements of plants, but from a different part of the world was condensed in Chemical Abstracts 38, 1596. The evidence reported shows that practically the same effects were observed in regard to organic matter, when magnesium fertilization was attempted. However lime enters the picture, it increases the effectiveness of the applied magnesium, showing that the chemists are recognizing the value of dolomitic limestone. The author had difficulty in finding a reliable method of testing soils for magnesium, especially soils naturally high in humus. He states that there was no perceptable action of magnesium on this type of soil, either good or bad, which speaks volumes. Another note on the subject of prevention of damage to the soil by a high humus content may be found in a report on an attempt to sterilize soil by using chloride of lime. The author, a Russian, found that the chlorine penetrated sandy soils low in humus to considerable depth, but in chernozem soils, which are naturally rich in organic matter, the chlorine was retained in the top part and that underneath was not sterilized. The depth of penetration was inversely proportional to the organic content. While on the subject of toxic soil conditions it is interesting to note another summary that appeared originally in the Proceedings of the American Society of Sugar Beet Technology No. 3, p. 138-48 (1942) and was exerpted in Chemical Abstracts 38, 2782. The article was entitled, *"Resume of Commercial Fertilizer Studies with Sugar Beets"* by A. W. Skuderna:

"In the irrigated areas of the Arkansas Valley it is evident that maintenance of a high content of organic matter in the soil as a buffer against excessive alkali salt accumulations is of extreme importance. Other indicated correctives are: application of Sulfur and Lime, both of which have shown good results. Phosphorus deficiency is noticed in 78% of the soils. Nitrogen fertilization is profitable on light textured soils, but the percentage of Nitrogen in the fertilizer must be kept low to avoid injury to the germinating seed. General use of Potash is not required but its effect on the keeping quality of the best is evident, even when there has been no increase of yields of sugar per acre. Use of minor elements has not produced outstanding results, but there are indications that copper may be

beneficially utilized in some areas." The temptation to underline the last two words of the first sentence is almost irresistable.

An example of the harmful effect of fertilizers which may not be so well known but is none the less serious is brought out in a study by M. R. Huberty, published in the California Citrograph 29, p. 178-9 (1944). (Chemical Abstracts 38, 4077).

"Ammonium sulfate, fertilizers containing Sodium, and irrigation waters high in such saline bases as Sodium may reduce the rate at which water will penetrate the soil. When applying fertilizers of this type it is good practice to use a number of light applications rather than a large single application. Should poor penetration result from the application of these fertilizers, improvement can generally be accomplished by the addition of organic matter or lime or both." Why use the fertilizers at all? Apparently the soil can recover somewhat from light applications, insofar as water penetration is concerned, but what about the other well known and serious effects: the killing of organic life within the soil and the accelerated erosion generated by these chemical fertilizers?

Another horrible example of present practices and the results that they cause is contained in an article published in the Washington Agricultural Experiment Station Bulletin No. 437, 1944, by C. L. Vincent, entitled, "Vegetable and Small Fruit Growing in Toxic Ex-Orchard Soils of Central Washington." It states, "Because of heavy sprayings of lead arsenate applied to apple trees for 30-40 years, toxic quantities of water soluble arsenic are present in the top 5-6 inches of soil. Unless the arsenic content is reduced to about 2 parts per million it is useless to attempt to grow vegetables or small fruits of low arsenic resistance. Satisfactory results have been attained by growing rye and ploughing it under or without cow manure; but in sandy soils, containing 20-30 parts per million of water soluble arsenic at the time of removal of the trees, rye may have to be grown for four or five years. Tolerance of a few crops to Arsenic has been determined. The most tolerant are asparagus, potatoes, carrots and tobacco. Asparagus often occurs "wild" in many arsenic treated orchards. There appears to be a varietal tolerance of some horticultural crops toward water soluble arsenic. Some crops were less affected by soluble arsenic in clay soils than in lighter soils. This is probably related to the organic-matter content of the soils." Not a word is said about the poor human beings who might eat the potatoes or asparagus! On the same page appeared another summary in which three men state that the amount of arsenic absorbed by vegetables is directly related to the amount of this poison in the soil. They also state that the amounts were extremely small; but the human body apparently has no method of getting rid of lead or arsenic, and any toxicologist will tell you that you still have all that you have ever ingested. One other valuable suggestion comes out, it is: the most sensitive plant to arsenic is the lima bean. If we use this plant as an indicator and it will not grow properly in the soil that is suspected, don't eat the vegetables from that ground until the organic content is up to perfection.

It would be a tremendous undertaking, but one of vast importance, if someone could start a collection of summaries taken from sources such as that mentioned above, that would eventually give incontrovertable proof of the fallacies of artificial fertilizers and the necessity of using Organic methods. Such a collection could easily be made on 3 x 5 filing cards, the way Mr. Willis started his bibliography and later published in paper bound, letter-size pamphlets. Readers of "Organic Gardening," who have access to experiment station reports and pamphlets could send in their findings and the evidence would soon be staggering. Without doubt some of the best articles would come from magazines of the fertilizer trade.

Here and There

By J. I. RODALE

IT'S TOO MUCH LABOR . . . .

A bright young farmer visited our offices recently making a special trip of fifty miles to ask questions as to how he could apply the organic method on his hundred acre farm. He could see the advantages of getting a lot of humus into the soil, in fact he was mighty enthused about it, but finally asked, "But when will I find time to make compost?" There is a rather devastating repetition of this particular thought whenever the average farmer considers the question of organic farming, so it wasn't entirely unexpected, and I was prepared.

"How much do you spend for chemical fertilizers a year?" I asked. He figured a moment and replied "Oh, I reckon about $400 a year."

"That's about $8.00 a week," I reminded him, which means that he could hire someone for a day or two a week to do all the work of making compost. The labor situation in these parts is easing up tremendously. Recently we advertised for a farm-hand and received 22 applications for the position. It had been raining cats and dogs for two days which gave me a splendid opportunity to show this farmer a graphic illustration of the advantages of organic farming. I drove him to a nearby farm where I knew the accent had been on the use of chemical fertilizers. There was a tremendous field on each side of the road newly plowed and planted in corn. In each field there were two or three bowl-like recessions in which ponds of water had accumulated. It looked pretty if you ignored the tragic implications. Naturally, the land was hard and the water couldn't seep away. We continued to drive around and saw farm after farm holding water in similar recessions. Then we drove back to our place and I showed him some fields with bowls, but not a drop of water stood in them. The water was absorbed right into the ground as it fell. Five years ago these bowls on our farm also formed ponds in heavy rains, but thanks to compost and the increase of the earthworm population, our land is a pleasure to cultivate. It is a sight worth witnessing and the young farmer went home determined to start organic farming immediately.

●

LANCASTER

I inspected several farms in the famous Amish belt in Lancaster, Pennsylvania, a few weeks ago. My main purpose was to see a Fordson manure loader in operation. This device attaches to the front of a heavy tractor and will lift a ton of manure at a grab. It is a remarkably simple piece of equipment which reduces the labor of handling manure and green matter to a small fraction of the hand-labor time. It promises much in reducing the labor of making and turning compost heaps. Practically every agricultural implement manufacturer makes one. In one field the farmer who had recently acquired the place showed me a knob of land on a mild hillside where all the topsoil had disappeared—completely washed away. A crop of wheat seemed to be flourishing in pure clayey sub-soil, thanks to chemical fertilizers. But he is setting aside one of his farms of a hundred acres which is to be operated on an organic basis, mostly by sheet composting, that is, growing green manure crops and applying animal manure over it when it is plowed under. Incidentally most of the

farmers in this section do not plow for wheat, using the disc. They have been following this method long before Faulkner wrote *Plowman's Folly*. It seems to be practical under their conditions.

On driving around with these two Lancaster farmers I showed them places on their land where water was being held in low spots, and told them that after a few years with the organic method, that would never happen. They seemed skeptical but were willing to give it a trial. In one place such standing water had seriously damaged crops. One of the farmers told of a conversation with a nurseryman which I am sure will give our readers a laugh. I had told him that I was not in favor of the *ordinary* method of sheet composting, in which raw manure was broadcast over the cover crop and allowed to rot in the field. I would rather make neat heaps of the manure, covering it with a few inches of earth and allow it to rot before being applied to the land. It should be spread over the growing green matter immediately before plowing under.

He said that a lady went to this nurseryman and wished to purchase some manure for her flower beds.

"I do not have any, ma'm," said the man "but if you buy any elsewhere, be sure it is *old* cow manure."

"How old must the cow be?" ventured the lady - - - - - - -

Well, the revolution is on. Hundreds of farms are changing over or experimenting with the organic method. In one day recently we received six letters from farmers expressing such plans.

●

UNCLE HORACE

The *Readers Digest* recently ran a little item which was sent in by Wayne Bloomberg of Wormleysburg, Pennsylvania in which Wayne remarked about how Uncle Horace of Riley County, Kansas, hated tractors. He farmed his 260 acres with horses exclusively. A tractor salesman was trying to convert Uncle Horace to the virtues of tractor-farming, but was getting nowhere rapidly. "When you can get those 200 horses' power in that there engine", said Horace, "to produce fertilizer, I'll buy one." The same thought was expressed by the Wit who once said that "anyone who can develop a tractor which gives manure can make a million dollars."

Perhaps Uncle Horace is not the saint we think he is. He is a romantic figure, I admit, but let's be practical. The tractor is a valuable piece of farming equipment and it is no sin to use it. We have one on our 63 acre farm and it is a part of the advancing technique of agricultural technology. Just because we want to work with nature does not mean that we must bog ourselves down in medieval slavery. True the horse gives manure, but Uncle Horace must set aside many acres on which to grow oats and hay for his beasts of burden, and he must "waste" much of his manure to fertilize these acres. We must also bear in mind that animal manure alone is not a balanced fertilizer medium.

Sir Albert Howard, who spent 30 years studying the ways of natural plant growth discovered that over a period of years the soil needs three times as much plant as animal matter, and that is the basis of his method of making compost. Many old-time farmers who depended on animal matter alone were violating an important law of plant growth. Many others who were wise to it, had large pits into which they were careful to see that much residual plant matter was thrown in along with the manure.

Uncle Horace in Kansas may be a wheat farmer who plants nothing but wheat year after year, perhaps with slight variations as to cover crops etc. If he had tractors and fattened beef steers or ran a dairy and used the tractor to help round up green matter for composting, or to practice sheet composting he might secure better farming results. Good old Dobbin. You worked him for ten or eleven years and then he went to the glue factory. By gad, farming with oxen is more practical. When you finish with them, you can eat them!

IN THE LION'S DEN

A few weeks ago I was in the library of an Agricultural College, when I spotted a man reading *Organic Gardening*. I introduced myself. It was rather a double coincidence because we discovered that we had been corresponding on the subject of a method of converting rice straw into compost. The man had an appointment with one of the professors, a great figure in the world of agriculture, who had written great texts in the field of agronomy. I had often wanted to meet that man so it was agreed that I should sit in on the meeting.

When I was introduced to the great figure he did not seem to be too well pleased. His lips were extremely thin, but they were pressed into even greater thinness. Then he parted them with, "Mr. Rodale, you are doing a great deal of damage". I readily admitted it by my answer. "Yes," I said "I am doing a great deal of damage, but not to farmers or gardeners." There followed a short back-and-forth discussion. The great figure seemed to soften about two percent and since he was only human and should be kind to strange visitors he ended up with "Mr. Rodale, I am sorry for what I said. I should apologize." We agreed to meet again some day.

●

ORGANIC FOOD AND ULCERS

During winter we grow the family vegetables in a hot-house run on the organic basis 100 percent—no chemical fertilizers and no sprays of any kind but water. Towards along the end of the season there was on oversupply of cauliflowers and we gave some to a friend. I ran into him a week later and he told an interesting story. "When we had your cauliflower we had some visitors for dinner, a man and his wife. The latter ate the cauliflower freely but her husband wouldn't touch it. He had stomach ulcers and it seems every time he ate cauliflower there followed a severe attack of sickness. His wife was so taken in with the wonderful taste of the vegetable that she kept asking her husband to try some. It took a little asking and finally the man weakened. He seemed to like it and came back for extras. He was sure he would become very sick. However, nothing happened. I checked with him a few days later. He said it was the first time he had eaten cauliflower in years that he wasn't taken sick."

The Acidity Question

IF A FARM OWNER finds that his soil does not test according to the desired formula because he has acid soil, he need not be discouraged; he need not try to change his whole farm over by applying carloads of lime. After all, many of our common crops demand an acid soil; not only does corn thrive at a high acidity level as well as close to neutrality, with a gap in between where it will not grow, but rye and lupine, seradella and sand lucerne, potato and tobacco, water melon and blueberry require acid soils. The specialties that could be grown on a small scale are numerous too: Heathers, trilliums, azaleas and rhododendrons, kalmias and many others will not succeed on neutral soils; and the most delicious strawberries grow on acid soil also. After all, not everybody need grow the same crops.

Reader's Correspondence

Send stamped self-addressed envelope for reply.

Visitors to Organic Gardening Farm welcome. — Closed on Sundays.

WHAT IS GREEN MATTER?

Q. In the compost references, there is frequently one dealing with green matter. What do you mean by this expression?

N. L., Princeton, N. J.

A. By "green matter" we mean really all substances deriving from plants. The better expression would be "plant matter". It includes, first, the leftovers from the kitchen, second, the weeds and culls from vegetable and flower gardening, third, weeds and grass clippings from lawns, meadows, roadsides, etc., and fourth, special plant material gathered for composting, for instance, cannery refuse, spoiled silage, cotton gin refuse, hay, straw, and finally, leaves. These materials contain various minerals, but also large amounts of carbohydrates; they supply therefore energy food for the growing bacteria and are, in the process of being digested, broken down into compost, if also "animal matter" is supplied which adds nitrogen or growth food.

—o—

WHERE SHALL I GET EARTH?

Q. You people who have farms can probably not imagine the small city fellow who has no land to draw on for reserves. When I make my compost heap I am always in need of earth. Where shall I get it?

P. F. L., Malden, Mass.

A. When you consider that your compost goes back into your garden you need not be so stingy with your garden earth. Use some of it, possibly digging it out of the walks between your beds or rows, and get it enriched through the composting process. Then you put it back into the garden and see things grow a bit faster. Nothing is lost. You simply practice rotation in a new manner.

—o—

WHAT DOES FINISHED COMPOST LOOK LIKE?

Q. Please describe the finished product of your composting process. Not knowing what good compost is like, I am at a loss to determine when my compost is finished.

Mrs. J. B., Atlanta, Ga.

A. Some people think the result should be crumbly like old leaf mold, but we are satisfied with a compost in which the straw, grass clippings, and possibly more refractory substances, such as corn stalks are broken up. When we apply compost on the farm or in the garden, the mass is crumbly, not soggy; but you could still determine its origin. No harm is, of course, done when such compost is allowed to disintegrate still further and to break up into finer material, but for ordinary gardening purposes this is not necessary because the final decay takes place in the ground. For flower growing, especially potted plants, and for starting seedlings it is good to screen the rougher material or to use the fine parts that develop a little later. Once compost has broken up to the stage of lumps, it does not take much longer to get a humus-like product by leaving it sitting for a while. In that case, however, protection against leaching out by covering with boards, hay or earth is indicated.

ORGANIC MINERALS?

Q. My understanding is that plants absorb only stable material through the root system, such as nitrogen, phosphorus, potash, and trace minerals. In one of your articles you say that humus gives the plant more of the minerals in organic form. Do plants take up minerals in organic form?

J. B., Twinsburg, Ohio

A. The expression "minerals in organic form" may be misleading to those who are apt to think that something is either inorganic, a mineral or an element, like nitrogen, or organic, which means the residue of living plant or animal matter, and therefore a carbon compound. But the fact is that we have in our own bodies many elements, including metals in organic form. It is in this sense that we speak of organic matter containing minerals.

Since your question is so interesting, let us summarize the major facts. The reasons why plants thrive better in a soil rich in organic matter are quite varied. One main feature is that without organic matter, the soil becomes baked, impermeable to water and air, and therefore unfavorable for root penetration. This matter was discussed in a recent article on sub-soiling.

A second point is that the soil minerals must be made available to plant growth. You know, of course, that in desert regions, the land is extremely rich in mineral elements, but does not support plant growth until a cover crop has been raised under irrigation and plowed under. As the carbon material disintegrates, it releases acids which work on the minerals. At the same time, the bacteria, which break down some of the minerals, are increased, since they use the carbohydrates for energy food.

Third, there are many unknown factors involved which we cannot explain, but which are present just the same. Professor Truog of the University of Wisconsin showed, for example, that boron became available only when organic matter was present in the soil. Without organic matter, a boron deficiency developed.

Fourth, there are indications that plants do not take up elements, but compounds and even highly complicated organic compounds.

Fifth, plants grow entirely different according to the form in which they are supplied an element. Whether this is due to the plant or to soil reactions is as yet unsettled; the fact, nevertheless, remains that plants fertilized with ammonia showed a different composition from plants fertilized with nitrate; yet the element nitrogen ought to be nitrogen in either case. Apparently, plants do not take up "stable" materials or elements, but respond greatly to the form in which an element is offered to them.

This matter is altogether yet to be solved in detail as the President of the American Society of Agronomy said in his recent address at Columbus, Ohio.

In conclusion, I should say that plants have undergone their evolutionary history in soils which were covered with the refuse of previous plant growth and that incorporating humus and humus-forming materials is, therefore, *the safest practice.*

—o—

RABBIT MANURE

Q. What do you think of rabbit manure in the compost heap?

P. J., Albuquerque, N. M.

A. It is excellent for the purpose. From the nutritive angle, rabbit manure is an excellent source of plant food and quite effective as a stimulator to composting processes.

—o—

MANURE

Q. What is there in manure that is not in a commercial fertilizer?

H. L., Santa Barbara, Calif.

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—o—

ACTIVATORS

Q. What is your personal attitude toward compost activators?

H. W. B., Lewistown, Me.

A. If they are chemicals, I do not use them. If they are bacterial cultures, I do not use them either. Why? I prefer to use organic materials for composting and have always had good success with them. I can see no particular advantage in adding bacterial cultures to a compost heap, because bacteria are abundant everywhere and will soon be present when you set up conditions for them. Besides, bacterial populations change constantly and I do not see that any mixture of cultures would be useful, since the first group acting on a compost heap would, in all likelihood, destroy the others or at least reduce their numbers by making conditions unsuitable. There is no objection in principle to bacterial activators, and small compost gardeners who have trash piles which they want to break down may possibly get some benefit from such products. Since I am sure that I wouldn't, I have no desire to spend my money on activators. I'd rather get a few bags of poultry manure instead.

—o—

FLOWERS

Q. What Flowers grow best with compost?

Mrs. J. B., Richmond, Texas

A. Almost all of them. Only the pinks and a few similar plants of the rocky ledges like a hard soil; the gladiolus can get along without compost, but can also take it. The acid-loving plants should be given compost without lime. But I do not know of a single outdoor flower that would not grow better if the soil had some compost in it. Those which absolutely need it and love it are the shade-loving plants and the broadleaf evergreens, azaleas, begonias, fuchsias, epiphyllums, the lilies, etc.

—o—

ALKALINITY

Q. According to an analysis of the Connecticut Experiment Station, my soil is too alkaline for potatoes. How can I overcome this?

E. L. G. H., Manchester, Conn.

A. From the analysis which you sent us and which shows your soil very low in nitrogen, it would appear that, first of all, your compost is not made with enough manure. I should also leave out the lime in the future, but an acidity of 6.7 pH is not necessarily too high for potatoes if you have your soil in good organic shape. Organic matter acts as a buffer against both alkalinity and acidity. Sir Albert Howard showed how, by composting, alkaline soils in India could be improved so that no damage to growing crops resulted. This is one of the biological miracles about compost. It counteracts extremes. For the organic matter ties up excessive soil minerals and thus takes them partly away from growing crops, releasing them gradually at the rate at which compost decays underground, which is the same rate at which plants take up substances for their growth.

—o—

LORETTE SYSTEM

Q. In your booklet on Fruit Orchards you say that all lateral branches above twelve inches are cut back to their base, so that the sap is forced into the fruit buds there. This doesn't mean that all branches longer than

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twelve inches are cut back to the trunk?

J. S., Hancock, Mich.

A. You are right; the statement might be misleading. The twelve inch side branches *which do not have fruit spurs* are cut off *on the main branches* of the tree. This system, summer pruning, was further discussed in an article by Mr. Wittrock, and we suggest that you use great care so that you do not ruin your trees. What it amounts to is the elimination of small twigs that do not show any fruit spur development.

—o—

THE GOOD OLD MOON

Q. What is your position as regards moon planting?

W. T. B., Louisville, Ky.

A. For outside gardening, the problem is too involved for us. There are no clearly proven facts about sowing or planting by the moon, because you cannot compare results. Suppose you plant on April 1, when the moon sign indicates that you should plant, and then get a nice long rain, warm weather, and good growth. By the time you can plant again, when your soil no longer puddles, on April 8, your planting is followed by a few hot days with cold nights. To what are you going to attribute the success of your first planting? To the moon or to the better growing weather? I personally watch out for temperature and moisture and wait for an overcast sky and then plant and get my things to grow. If I waited for the proper moon sign, I might miss out on other important weather factors. I am sure that the moon which produces tides must have an effect on soil water and plant growth, but I wouldn't want to gamble on it.

—o—

INSECTS AND SPRAYS

Q. Beneficial insects are injured by sprays and criminal elements flourish. Please explain to me this statement.

Why do the sprays not destroy all the insects equally?

B. F. R., Lake Forest, Ill.

A. During the last two years, several experiment stations have given out reports which we have printed in the magazine off and on about the very question which interests you. The so-called predators, which destroy undesirable pests, are apparently less adaptable and more specialized than the plant pests. When you spray, you kill off the weakest specimens of the plant pests and cause a selection of the most resistant specimens. The predators, if not succumbing to the spray itself, will lose out because the basis of their food supply, the plant pests, have been reduced. Since insects increase rapidly, this leads to an elimination of the desirable and to a breeding of a spray-resistant undesirable insect group.

MOLES

Q. Should moles be destroyed? How about robins?

A. E. P., Minneapolis, Minn.

A. Moles are not welcome on a lawn but they do some good by destroying large quantities of insect larvae; this is more important than the fact that they also eat earthworms. Traps may be set for moles should they become a serious problem.

While robins and other birds eat some of the crops, the quantity they take is small, especially when one considers the good most birds accomplish by destroying numerous insects. It does not pay to upset the balance of Nature by discouraging all the birds and certain animals—as they are the lesser of two evils.

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CITRUS PEEL

Q. We have some orange rinds every day. Are they of any value in the compost heap?

M. M. F., Memphis, Tenn.

A. An ash analysis of orange rind showed a content of almost 3.0 per cent phosphoric acid and 27.00 per cent potash. This is similar to the skins of other citrus fruits and to potato peelings. The latter may even be higher in phosphorus. But while potato skins are rather low in nitrogen, some citrus fruit, especially the spongy skins grown on fertile soils, have considerable amounts of nitrogen in them. We should therefore advocate the use of all such material in the compost heap.

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